

PLUS CD-ROM ColorImpact (full version), tutorials, images and more...

# Adobe Photoshop

## Managing Colour

Master Photoshop's full range  
of colour controls and create  
intense, captivating images



**FocusGuide**  
From the makers of **Computer Arts**



132 pages of easy-to-follow tutorials and expert advice  
to help develop your Adobe Photoshop skills





# Brighten up your life...

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Understanding Photoshop's colour controls is your passport to creating irresistible images every time...

If you don't know your RGB from your CMYK, then you've come to the right place. Photoshop has a number of ways of dealing with colour, depending on what you intend to do with the finished image. This Focus Guide helps to demystify Photoshop's colour controls, removing the guesswork from your choice of colours and ensuring that your images are always as vibrant and colourful as you envisaged.

Getting to know the basics is an essential first step. Understanding the way colours are composed by your computer screen and by the printing process will help you choose the right Photoshop options for the task in hand. It will also make it easier to identify faults in your images, and perform colour corrections to compensate. We've dedicated two chapters to tweaking the colours in your digital snaps, which will bring the best out of your images – even the ones that seem disastrous at first!

Photoshop also offers some impressive colour-based special effects. With just a few commands you can transform standard snaps into colourful masterpieces, and we'll show you how to create the perfect black-and-white image from a colour original.

On your disc this month is a feast of colour-based resources, including a full version of ColorImpact 1.7, to help you create stylish colour schemes for any design job. We've also included 106 minutes of expert video tuition, 20 professional stock images and 30 custom gradients. Turn the page and make your Photoshop experience a more colourful one!







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# Finding your way

Our handy icons hold the key to a wealth of additional information. Here's what they all mean...

With so much to cover on such a broad subject as working with colour in Photoshop, it's hard to find room for all the information we want to give you. That's why you'll find the special icons that occupy the margins on each page so useful.

As you leaf through the pages, you'll find a range of eye-catching symbols, each of which indicates an extra nugget of knowledge. The icons enable you to identify exactly what kind of information you're dealing with – for a guide to icon

categories, see below. These handy hints and tips are always relevant to the topic that's being discussed, and will help you develop your Photoshop skills that little bit faster.

Our writers are always experienced Photoshop experts who regularly contribute to our sister magazines, such as *Computer Arts*, *Computer Arts Projects* and *Digital Camera Magazine*. So you can rest assured that all the information they provide is both authoritative and thoroughly tried and tested.



## On your CD-ROM

Tutorial files, trial software and more besides is included on your CD-ROM. Every now and then we remind you of this by flagging up the disc icon and listing what's on it. Handy, eh?



## Take note

You'll find a number of these nuggets of knowledge scattered throughout the Guide. They're crammed with useful information that complements the main text perfectly.



## Top tips

This indicates an expert tip. Anything sheltered beneath this icon is guaranteed to reveal a useful tip, or advice about Photoshop's range of tools, options and features for working with colour.



## Watch out!

The 'skull and crossbones' sign means proceed with caution. You'll find some important points outlined below this icon, which you should certainly take seriously.



## Further information

We'd like to tell you absolutely everything, but there's just not enough space. Instead we refer you to other useful resources, such as websites and specialist books for further reading.



## Links

When we refer to a website, we may pull out the web address in the sidebar to make it easier for you to read and remember.



## Shortcuts

Carrying out common tasks again and again can get a little tedious. Our handy shortcuts show you how to carry out these tasks with a few deft key-presses, saving you lots of time and effort.

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# Chapter 1

## COLOUR IN PHOTOSHOP: THE BASICS

### *In this chapter...*

- ☐ Get a grounding in colour perception
- ☐ Make sense of bit depth
- ☐ Learn about 16-bit editing
- ☐ Master the Channels palette

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You'll understand Photoshop better once you know how it defines and deals with colour in the digital realm. Here's a quick guide to colour perception, bit depth and channels

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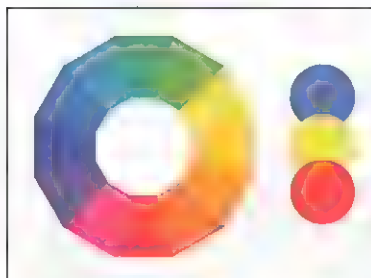
**B**efore you start juggling with Photoshop's high-end colour adjustment functions, it helps to have an idea of what the program is up to. While most filter effects and simple controls such as Brightness/Contrast can be applied without any specialist knowledge, true mastery of Photoshop demands at least a basic understanding of how colour is defined, both in terms of human perception and on your computer.

### **Primary colours**

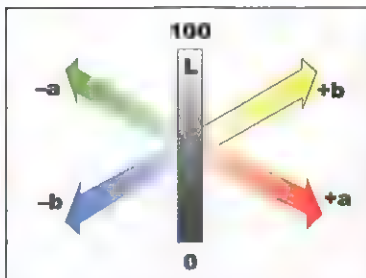
The principles of image colour editing revolve around defining primary colours, and how they're combined to produce secondary

colours, and so on. You might have to cast your mind back to your schooldays for the fundamentals behind colour primaries. But instead of mixing paints and overlaying acetate, you're mixing light and overprinting inks; the primary colours may be different from those you're familiar with, and they interact in ways you might not expect.

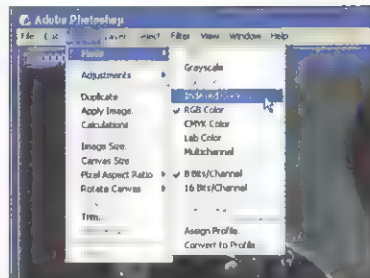
Photoshop also employs special definitions of colour which owe more to theories of perception than merely mixing primary colours. A definition of colour through the components of hue, saturation and brightness may be new to you, as might the industry-standard concept



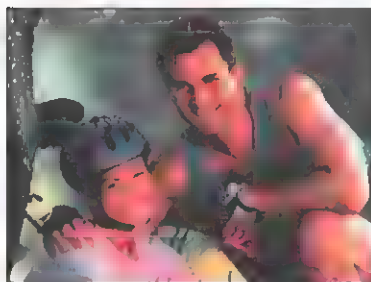
**Page 12** Learn the colour wheel principle and see how colours work in harmony



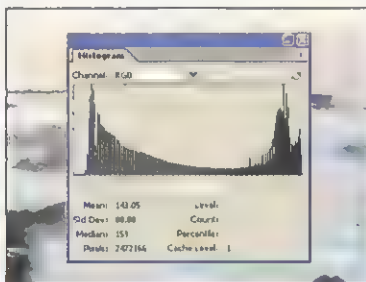
**Page 13** Get a grip on colour perception theories and make sense of HSB and LAB



**Page 14** Learn about colour modes and bit depth, and switching between them



**Page 15** See the effect of reducing bit depth and the colour range in an image



**Page 16** Learn about 8-bit and 16-bit-per-channel editing options



**Page 17** Use primary colour components as individually-editable channels

of LAB colour space, for example. The following pages provide all the explanations you need.

## Channel crossing

Putting these theories into practice, Photoshop stores colour information in 'channels' which are normally viewed together, but can be edited individually. This is key to understanding many advanced colour adjustment techniques, such as Curves and Levels. In practically every case, customising colour adjustment on a channel-by-channel basis, or even just rebalancing the channels interactively, produces far superior results to fiddling with an

image on a trial-and-error basis. We also explain the meaning of 'bit depth' and its relation to colour channel information in Photoshop.

This chapter covers some fairly advanced topics, but is deliberately brief. All you need is a grounding in the concepts of colour make-up, so that you can conduct adjustments in subsequent chapters with precision. Image problems such as 'it looks a bit yellow' or 'that person's face looks pale' are more effectively tackled when you understand how Photoshop defines colour in the first place. Armed with this knowledge, you'll be able to correct and enhance colour images with confidence.



# Harmony with colour wheels

The artist's colour wheel helps you understand how different colours blend with each other

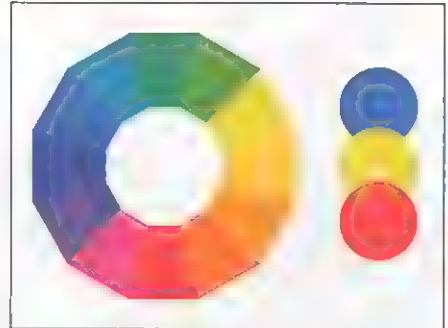


## Colour wheel downloads

You might like to keep your own digital colour wheel to hand. Windows users can try ColorImpact 2 from TigerColor ([www.tigercolor.com](http://www.tigercolor.com)). Mac users should go for Color Consultant Pro from Code Line Software ([www.code-line.com](http://www.code-line.com)). Both programs are commercial products, not freeware, but you can download full working versions immediately to try out.

Artists have used colour wheels for generations to devise harmonious colour schemes without resorting to trial and error. The wheel is basically a spectrum bar that has been bent around into a full circle, traditionally sliced into 12 sections like a clock. It's based upon the three primary colours used in painting: red, yellow and blue.

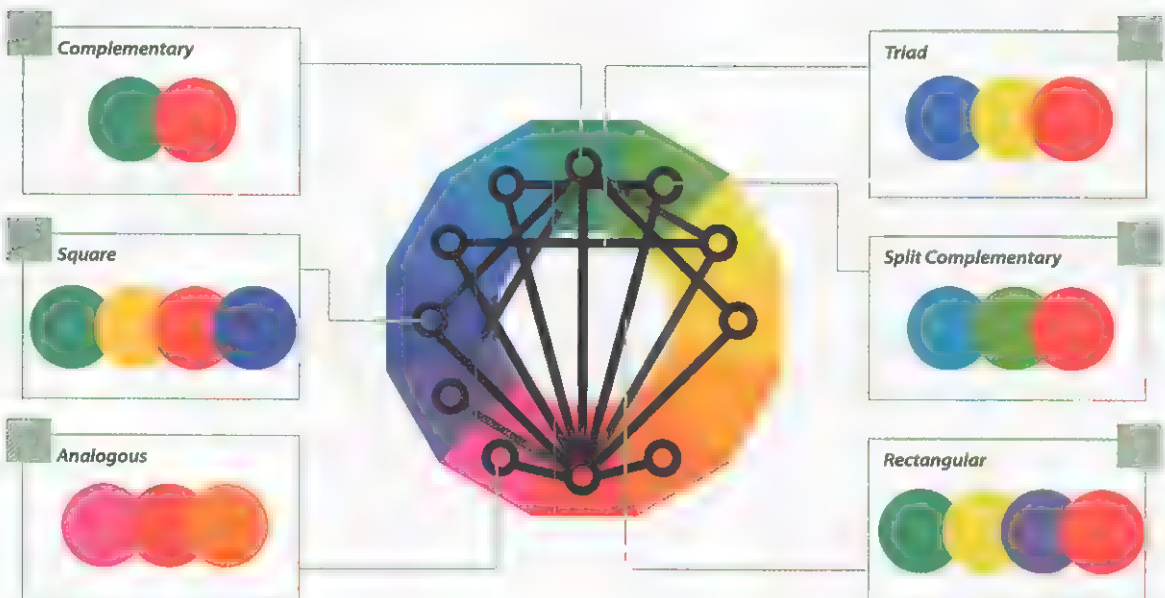
Even if you're only interested in using Photoshop for working on photos, an understanding of how the colours of the spectrum interact with each other will stand you in good



Use this representation of a 12-step colour wheel to identify how primary, secondary and tertiary colours interact

stead when it comes to dealing with the principles of colour perception (opposite), channels and so on.

## CHOOSE A COLOUR SCHEME

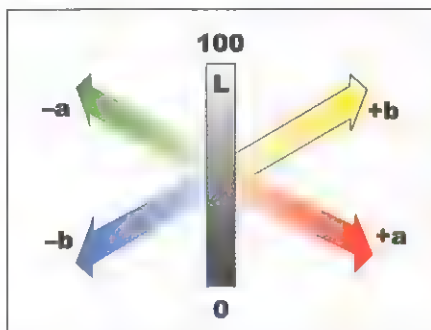


# Theories of perception

Photoshop uses different models of colour perception, so here's a quick guide

The retina at the back of the eye contains three types of receptor 'cone', responsive to either red, green or blue wavelengths. But modern theories of colour reproduction tend to include yellow as a fourth primary, setting the four up as opposing pairs: red/green and blue/yellow.

Another theory defines colour by three completely different attributes: hue (the basic colour), chroma (intensity or saturation) and value (lightness or brightness). Another theory combines both these methods, with the red/green and



LAB theory defines colour in a three-dimensional space with four opposing primary colours, modified across the third axis by lightness

blue/yellow axes modified by a third axis, which measures lightness from black to white.



## Web colour

Photoshop and many other graphics programs enable you to pick from a library of 'web-safe' colours, or create new web colours using slider controls. These are actually RGB selections that have been locked to a core colour palette supported by web browsers. This model is inherited from the days when many computers could only show a maximum of 256 colours, and is largely irrelevant today.



## Learn more

The internet is a good source of information about colour models and the various theories of colour perception. One of the friendliest sites is PaintCafe.com (<http://paintcafe.sympatico.ca/en/couleur/langage>), which not only covers the technical basics but also investigates the symbolic associations and psychology of colours.

## PHOTOSHOP'S COLOUR MODELS

- **RGB** is the common red-green-blue set of primary colours which Photoshop naturally uses to define on-screen colour, since your computer display itself also employs the RGB system.
- **HSB** stands for hue-saturation-brightness. Other graphics programs may use slightly different names for the same colour model, such as HSV and HSL. Hue is effectively the same as the colour wheel opposite, and is measured in degree increments within a circle (0 to 360). Photoshop lets you adjust saturation and brightness in percentage increments (0 to 100).
- **LAB** colour is shown in the graphic model above, in which 'L' represents lightness from black to white (0 to 100), 'a' is the red/green axis (-120 to +120) and 'b' is the blue/yellow axis (-120 to +120).
- **CMYK** refers to the primary colours of printing, rather than light, which are covered in more detail on page 21.

# What is bit depth?

Computers define colour in binary digits that indicate which different colours can be used



## **Pixels in particular**

A 'pixel' – derived from 'picture element' – is the smallest component of a digital image. Every dot on a computer display is known as a pixel, for example, as is each dot comprising a picture in Photoshop. But if you don't view the image at exactly 100% zoom, the picture's pixels and the display's pixels won't correspond. As you increase the zoom level, you'll begin to distinguish the individual square pixels in the picture.

Every single pixel in a digital image is assigned a specific colour. The range of colours that are available to that pixel is determined by the complexity of the binary digits which are employed to describe it – literally the number (or 'depth') of 'bits' of digital information. Put simply, the more bits that are used to describe the pixel, the wider the range of colours it can choose from.

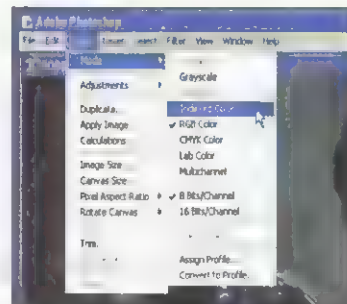
One bit, for example, can only describe black or white: the bit is either on (white) or off (black). But

eight bits allows a pixel to be any of 256 steps from black to white, since 256 is the maximum number of permutations of a string of eight ones and zeros. A graphics program such as Photoshop assigns eight bits to each of the primary colours red, green and blue, so that every pixel can be any one of  $256 \times 256 \times 256$ , which equals 16.7 million different colours. This range offers almost unlimited variance for practically all purposes, and is commonly known as '8-bit-per-channel' or more simply '24-bit' colour.

## DROPPING SOME BITS

The bit depth of an image determines its file size

By default, Photoshop always expects to work in 8-bit-per-channel mode. Practically all pictures imported from digital cameras and scanners, for example, are already set to this bit depth. Photoshop additionally supports a deeper 16-bit mode, which is explained in more detail on page 16. The greater the bit depth, however, the bigger your picture files, the more disk space they occupy and the more memory required to view and edit them. In turn, reducing the bit depth of an image will reduce file size. Switching an image to Indexed Color mode immediately reduces the bit depth, so that each pixel can only be one of 256 different colours.

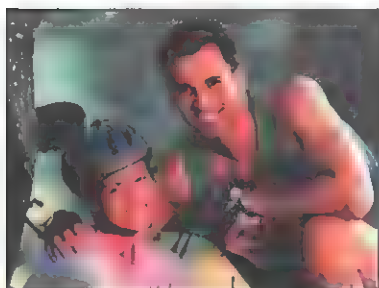


Select **Image > Mode** to access the commands for increasing or decreasing the bit depth of an image



# Reducing pixel colours

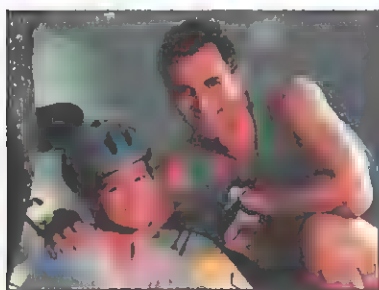
Switching to a lower bit depth reduces file size, but causes image quality to deteriorate



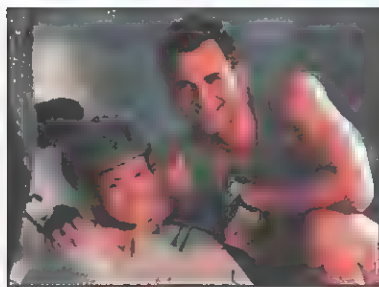
In 8-bit-per-channel mode, this digital photo appears as it should, with realistic clarity and smooth gradient effects in the background. This is because every pixel can be any of 16.7 million different colours, and the tiny adjacent variations in colour from one pixel to the next fool the eye into seeing continuous tones.



Here the image has been switched to Indexed Color mode, which has reduced the choice of colours per pixel from 16.7 million to just 256. At this size, you probably can't see any difference, but close up you would notice that some of the continuous tones look grainy, because of bigger jumps in colour from one pixel to the next.



Dropping down to 126 colours, you should start to see the difference. The file size is less than a quarter of its original 8-bit-per-channel state, but it's pretty clear why: lacking enough colours to produce continuous tone effects, the image begins to suffer from banding, posterised effects (see page 77) and more dottiness.



This version of the photo uses just 16 different colours. At this point, the picture looks more like an illustration than a photo. Of course, this might be the effect you're after, but Photoshop offers you much more effective ways of reducing the colours applied throughout an image – see Chapter 6.



## CMYK channels

Photoshop's default 8-bit-per-channel mode assumes three channels, specifically red, green and blue. Switching to CMYK, which comprises four colour channels, doesn't affect the bit depth, since the program continues to work in RGB mode: the CMYK preview and related pixel colour information is calculated 'on the fly' by the software.



## One-way trip

Reducing the bit depth of an image, say from 16-bit to 8-bit-per-channel, or using the Indexed Color command to drop the number of colours to 256 or less, physically alters the pixel colours. If you change your mind and try to increase the bit depth again, you won't get the original colours back. The only way to do this is to use the Edit > Undo command to reverse what you've just done.

# Editing 16-bit images

Maintain a higher level of quality when editing by working in 16-bit-per-channel mode



## Limited functions

When you switch to 16-bit-per-channel mode, Photoshop loses some functionality. Certain tools won't work in 16-bit mode, nor will many filter effects. Photoshop CS is a lot better than Photoshop 7.0 in this respect: Photoshop 7.0's 16-bit-per-channel mode greys out half the program's tools and menu commands.

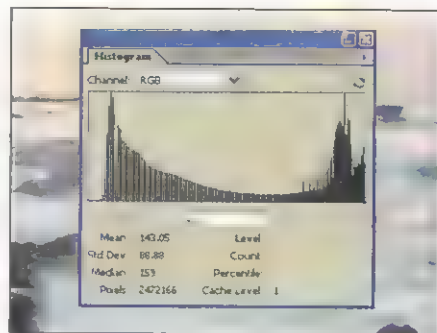


## Beyond Photoshop

Photoshop is all but unique in letting you edit at such high bit depths. This support is not available within Photoshop Elements or most other photo editing programs, including Jasc Paint Shop Pro. However, the feature is supported within Corel Photo-Paint 12. Ultimately, it's a feature aimed at high-end imaging professionals, rather than the home user.

Most software for viewing and editing pictures can only deal with 24-bit (8-bit-per-channel) images, and most monitors can only show 24-bit or 32-bit colour. So why does Photoshop provide a 48-bit (16-bit-per-channel) mode? Well, the idea is that editing an image within a greater bit depth preserves finer distinctions in colour, even after converting back down to 8-bit mode.

Quite simply, every colour edit is a destructive action which effectively loses colour information from the original image, especially the finer



The gaps in this histogram (see page 42) indicate colour information lost after the image was edited, but 16-bit-per-channel mode can help

details. Expanding the bit depth gives you more leeway as you edit, producing superior images.

## PROS AND CONS OF 16-BIT

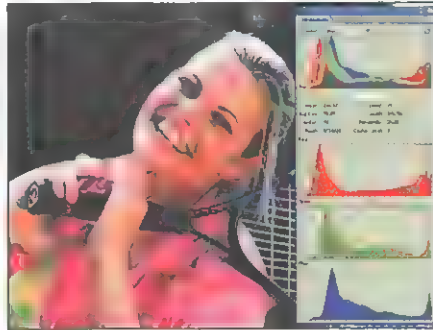
- ☐ **PROFESSIONAL** photographers with advanced digital cameras will be able to maintain the highest level of quality by importing images in Camera RAW format and editing them in 16-bit mode.
- ☐ **SCANNERS** often support 36-bit, 42-bit or 48-bit capture. If so, your scanning software may also be able to send the scans directly to Photoshop at this bit depth without converting down to 24-bit first.
- ☐ **IF DISK SPACE** is at a premium, be warned that 16-bit-per-channel images are typically double the file size of 8-bit-per-channel images.
- ☐ **IT'S NOT POSSIBLE** to see the difference between 8-bit and 16-bit-per-channel images on-screen – at least not before editing – because most computer displays are limited to the less detailed mode anyway.
- ☐ **MOST COLOUR** management profiles for displays (see page 97) are only calibrated for 8-bit-per-channel mode.

# Mastering colour channels

High-definition images are made up of editable primary colour channels

Photoshop images are made up of 'channels'. When editing in RGB, CMYK or LAB modes, these channels represent the primary colours in the image. For example, an RGB image is made up of three channels (red, green and blue), while a CMYK image comprises four channels (cyan, magenta, yellow and black). The colour image you see when editing is essentially just a combination of these channels.

Many of the colour adjustment functions covered in Chapters 4 and 5 allow you to make adjustments on



The colour information within this RGB image is represented in the Histogram palette (see page 42), revealing any bias in particular channels

individual channels, for example to compensate for a bias in one channel which is causing a colour caste.



## Switching channels

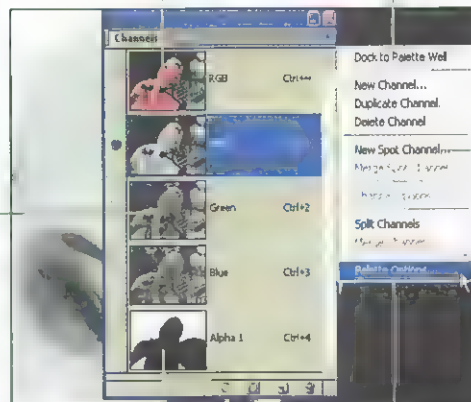
You can toggle between viewing individual channels by holding down the [Ctrl] key ([Command] on the Mac) and typing a number corresponding with the channel you want. For example, [Ctrl]+[1] switches to the red channel in an RGB image and [Ctrl]+[3] reveals the yellow channel in a CMYK image. Typing [Ctrl]+[~] returns to the full-colour composite view.

## NAVIGATE THE CHANNELS PALETTE

The composite channel is your default full-colour view when editing an image and is activated automatically, unless you specify individual channels to edit.

Click on any component channel in the palette to edit it individually. The view in the main editing window is normally shown in greyscale.

Alpha channels are masks for hiding parts of an image. They don't contain any colour information, but they're maintained in the Channels palette too.



The palette menu button reveals a set of context-sensitive commands which relate to the whole palette or currently selected channels.

You can add a 'spot' colour channel here. Anything you paint into it is treated as a single plate when outputting print colour separations.

Clicking on the Palette Options command lets you change the size of the channel thumbnails in the palette so you can view them more easily.



# INTRODUCING PHOTOSHOP'S COLOUR MODES

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Many photo-editing programs offer only one working mode, but Photoshop makes use of several. Let's look at RGB and the other modes, and discover the pros and cons of each

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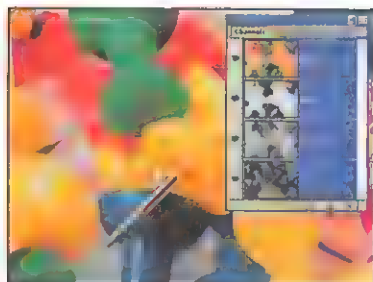
**T**he previous chapter outlined the basics of colour perception and explained theoretical colour models. Now we'll put it all into practice by introducing Photoshop's various colour modes, within which your image enhancement work will take place. Most digital photos exist in RGB mode, whether captured on a scanner, downloaded from a digital camera or created on-screen. But Photoshop provides many colour mode options in addition to RGB.

### **Pick a mode**

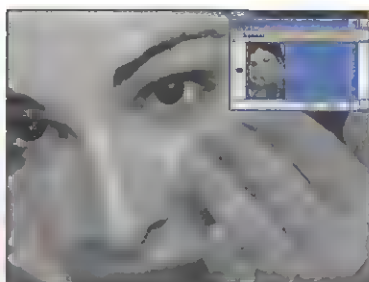
CMYK colour mode is targeted at print designers, and those working in print reproduction generally.

Photoshop's advanced LAB colour mode is intended for imaging professionals and jobbing photographers. Those importing their images from expensive digital cameras in Camera RAW format, for example, may prefer to enhance, adjust and edit them exclusively in LAB mode because of its superior colour gamut compared with RGB.

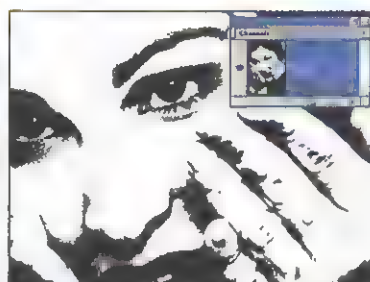
Serious designers can also make use of specialist modes such as Duotone and Multichannel. Although you're unlikely to be using these features every day they're pretty much unique to Photoshop, and need to be understood if you truly want to master the program. In addition to



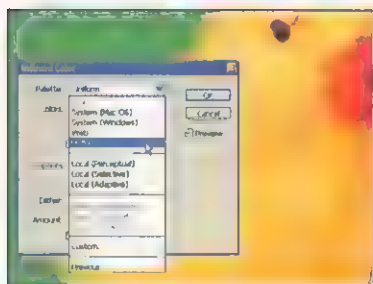
**Page 20** Discover the advantages and many uses of the default RGB colour mode



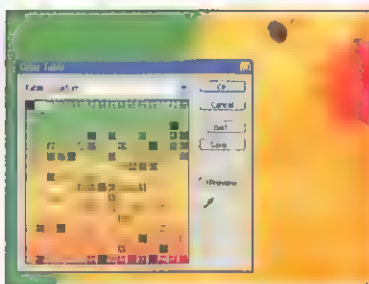
**Page 23** Learn how to turn colour photos into greyscale images



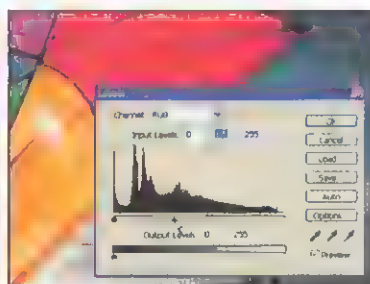
**Page 24** Generate special effects using threshold and customised pattern dither



**Page 25** Create impressive-looking duotones, tritones and quadtones



**Page 27** Convert a photo to Indexed Color mode and then edit its color table



**Page 29** Find out how you can undo automatic correction by scanners

these high-end modes are several standard ones found in most graphics packages including greyscale conversion, bitmap generation and 256-colour indexed mode.

## Adjustment options

The challenge for the Photoshop user is not just that you have so many different colour modes to play with, but that each mode employs its own system of colour channels and reproduction methods. They even use different sets of values to describe colour numerically. Some modes are appropriate for pre-press, while others are best reserved for websites and multimedia content.

A sound knowledge of all the colour modes available will ensure you always pick the right one for the job.

## Beyond theory

With colour theory in your pocket, it's time to get your teeth into Photoshop's colour handling for real. The following pages are not just a guide to what all the colour modes mean, but explain how and when to use them and customise how they're applied. We've included plenty of dos and don'ts, warnings, shortcuts and tips, including some guidance on file formats for certain specialist colour modes. Your images will look all the better for it.

# RGB colour mode

RGB mode presents a reasonably intuitive 'wide-gamut' space in which to edit images

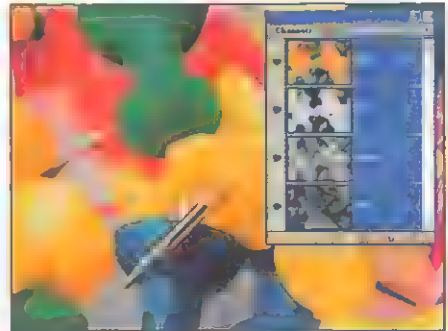


## Changing mode

Switch between the various colour modes by using the list of commands under the *Image > Mode* menu. The three main editing modes for photos are RGB Color, CMYK Color and LAB Color. The other modes in this menu are provided for creating special colour effects, and are explained later in this chapter.

Scanned pictures, photos from a digital camera and documents created in Photoshop are normally RGB images. The colour information within these images is split between three channels – red, green and blue – which can be edited all together as a composite, or individually.

RGB uses the same model to represent colour as your computer display, supporting up to 16.7 million different colours per pixel. This makes it an extremely versatile mode for editing photos as its 'gamut' (the range of colours it can work with) is



An RGB image is composed of red, green and blue channels which represent the primary colours of light, as also supported by your computer display

clearly very wide. You can view and edit individual channels by selecting them in the Channels palette.



## Colour Picker

Along with an HSB option (see page 13), Photoshop's Color palette and Color Picker window enable you to create and customise specific colours using RGB, CMYK and LAB values. Helpfully, when creating colours in this way, you're not restricted to the current image's colour mode (unless you've switched to Grayscale); you can define new colours using whichever mode you're most comfortable with. See Chapter 3 to learn how to do this.

## UNDERSTANDING RGB

**EVERY PIXEL** in an RGB image is assigned an intensity value ranging from 0 (black) to 255 (white) for each of its red, green and blue component channels. Increasing RGB values makes colours brighter.

**WHEN RED, GREEN AND BLUE** values for a pixel are different from each other (for example, R 200, G 60, B 170), intermediate colours are produced (in this example, pink). When the values are all the same (R 130, G 130, B 130), you get a neutral grey.

**IN A 16-BIT-PER-CHANNEL** image, the range of intensity values per channel rises to several thousand. However, you will still only be able to create and edit RGB colours using 0-255 values.

**COLOUR EDITING** involves adjustments to all three channels, not just one. For example, to increase the intensity of a red, you must also reduce the green and blue values.



# CMYK colour mode

Switching to process separation colour mode prepares your images for professional printing

**D**esigners working for print may prefer to switch Photoshop to CMYK mode, which converts the component colour channels to match those of process printing. This ensures that your images separate to printing plates precisely as you intend. You can continue to edit the images as normal while Photoshop simulates the CMYK conversion on-screen.

Be warned that the variety of colours available to CMYK mode is considerably less than those in RGB mode, even though it apparently benefits from an extra channel.

Being a print simulation, CMYK mode also simulates the limitations of ink on paper; no luminous colours are possible, for example, and subtle distinctions between tonal values may be compromised. For these reasons, it's always best to conduct all colour adjustments while still in RGB (or LAB) mode.

If you want to establish a colour-managed workflow (see Chapter 8), you may prefer to keep images in RGB mode and let the printing press 'profile' handle the final conversion to CMYK at the moment of output.



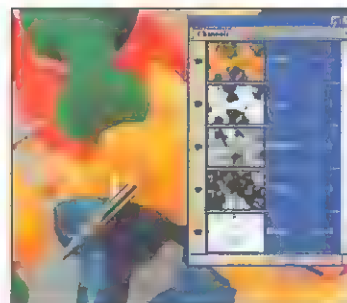
## Halftone screens

Unlike pixels on your computer screen, physical ink can only be one colour. To reproduce the illusion of intermediate variable tones and colours, images are printed as a pattern of tiny dots. This pattern is known as a 'halftone screen', or just 'screen' for short. The screen is generated only when your image is output to a printing plate or to film, not within Photoshop. The desktop printer equivalent to 'screen' is 'dither'.

## How CMYK WORKS

Process colour is a physical, rather than theoretical colour space

Most printing presses reproduce colour by overprinting cyan, magenta, yellow and black inks. Traditionally, the 'screen' of dots which make up intermediate colours is specified in percentage increments, so creating and editing CMYK colour involves entering values between 0 (no ink) and 100 (solid ink). Contrary to RGB colour, increasing the intensity of a CMYK value makes the colour darker, not brighter. Note that few printing presses can deal with 100% of all four inks ('rich black') at once because the paper tends to get too sticky. You can adjust the maximum ink coverage, and other details using Custom CMYK settings, as explained on page 103.



The separations shown in the Channels palette represent the printing plates for each ink colour

# LAB colour mode

LAB offers advanced, device-independent and industrial-class colour specification

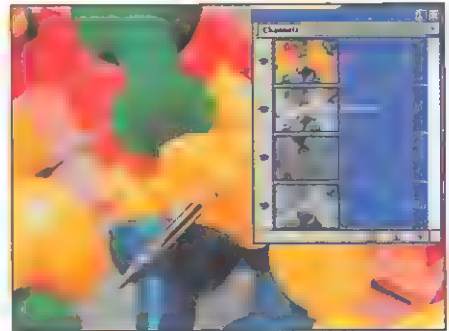


## Restricted formats

Images in LAB mode can only be saved to a limited choice of file formats. As well as Photoshop's own native PSD format, you can save to EPS, PDF, TIFF and DCS. You can't save to some of the more popular universal formats, such as JPG, BMP, PICT, GIF or PNG. You can, however, still export copies to web graphic formats using Photoshop's File > Save For Web command.

While RGB represents the additive primary colours of light and CMYK comprises the subtractive primaries of printing, LAB is merely a theory of colour perception. This is its great advantage, because LAB (or 'Lab' as Photoshop presents the term) is therefore not tied to one particular method of reproduction or physical device.

Although less familiar than RGB and CMYK to most people, editing in LAB mode does have certain advantages, such as the facility to adjust lightness (the L channel)



Unfortunately, LAB mode is not very intuitive when it comes to viewing or editing the 'a' and 'b' channels visually

independently of colour, or to adjust the blue-yellow balance independently of everything else.



## Middleman convert

Because of LAB's huge theoretical model of human colour perception, Photoshop uses it internally as its intermediate format when converting colours between other modes, such as from RGB to CMYK. Colour management systems and colour profiles (see Chapter 8) are also based on the LAB model, because of its device-independence, even though you're unaware of it.

## UNDERSTANDING LAB

**LAB MODE** has three component channels: lightness (L), a green-red axis (a) and a blue-yellow axis (b). Together, they form a three-dimensional model of all the colours perceivable by the human eye.

**IN PHOTOSHOP**, the L value is adjusted in percentage increments, from 0 (black) to 100 (white). The 'a' and 'b' components shift between negative and positive values to specify hues and saturation.

**CONFUSINGLY**, Photoshop's Color palette and Color Picker window are inconsistent in the 'a' and 'b' increments they use. The Color palette sliders range from -120 to +120, while the Color Picker allows values between -128 and +127.

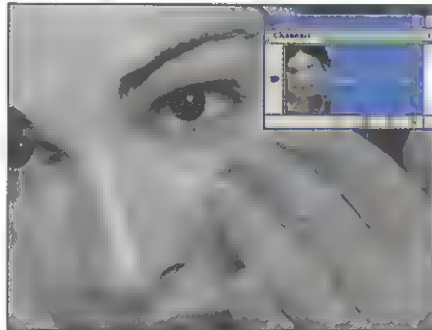
**FOR MOST** Photoshop users, LAB mode support is best employed only for converting existing LAB images, such as PhotoCD files, to RGB or CMYK mode, not the other way around.

# Grayscale mode

This converts colour pictures to greys, but we've given you some alternative methods to try out

**P**hotoshop distinguishes 256 levels within each of the RGB channels – that's the definition of 8 bits per channel. When you convert a colour image to greyscale (or 'grayscale' as the American program spells it), all this information is combined into a single 8-bit channel. Each pixel can be any of 256 different values of grey.

As well as producing black-and-white photos from colour originals, Grayscale mode is a mandatory first step before conversion to Bitmap mode or Duotone. But once you



*An image in Grayscale mode exists as a single 8-bit channel, in which the pixels can be any of 256 different grey values*

convert an image to Grayscale, any subsequent editing is restricted to within those 256 levels.



## Superior greys

A good-looking colour image can often produce a drab greyscale equivalent. This is because contrasting colours don't necessarily have much actual greyscale contrast. So, before making the conversion, enhance the contrast in the original colour image using Photoshop's Levels or Curves controls (see Chapter 5).

## ALTERNATIVE GREYSCALE TECHNIQUES

**USE THE IMAGE** > Adjustments > Desaturate command or use the keyboard shortcut [Ctrl]+[Shift]+[U] ([Command]+[Shift]+[U] on a Mac). This strips away all colour information but maintains full RGB mode.

**OPEN THE** Hue/Saturation dialog window by selecting Image > Adjustments > Hue/Saturation or use the keyboard shortcut [Ctrl]+[U] ([Command]+[U] on a Mac). Drag the Saturation slider all the way to -100.

**OPEN THE** Channel Mixer dialog window by selecting Image > Adjustments > Channel Mixer. Tick the Monochrome option at the bottom-left and adjust the grey contrast using the slider controls.

**IF YOU WANT** to use a specific channel as the basis for your greyscale, simply delete all the others from the Channels palette. Note that deleting a channel in RGB mode automatically converts the image to multichannel CMYK (see page 28), but the actual pixel information is unchanged.



## Pixel luminosity

Some basic photo editing programs and scanning utilities may produce greyscale images simply by dumping the red and blue channels from an RGB original, and using the green. Photoshop calculates greyscale conversions by analysing all channels combined, and then basing the grey values upon the overall luminosity of the pixels.



# Bitmap mode

Create raw, bleached-out black and white shots, or choose from a set of dithering options

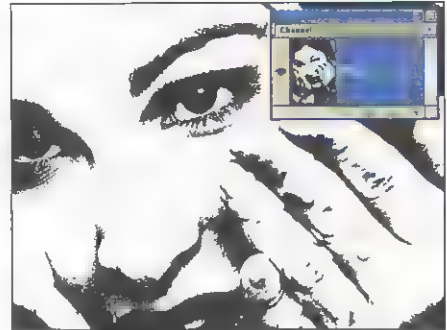


## Actual-size dither

When applying a dither or halftone screen to a Bitmap mode image, make sure the Output Resolution matches that of your intended reproduction size. If you apply a screen at a particular resolution and then print the image at a different size, the result may not print or photocopy as well as you expected.

Having converted a colour image to Grayscale mode, a Bitmap mode command becomes available under the Image > Mode menu. The term 'bitmap' is often used generically to describe any pixel-based graphic, but strictly speaking a Photoshop bitmap is a 1-bit image in which the pixels are either black or white.

Bitmap mode is very useful for preparing pictures for single-colour, non-digital reproduction. For example, if you design the artwork for a club newsletter or poster which



As well as being kind to mass-copied publications, Bitmap mode offers the potential for creative and often startling design effects

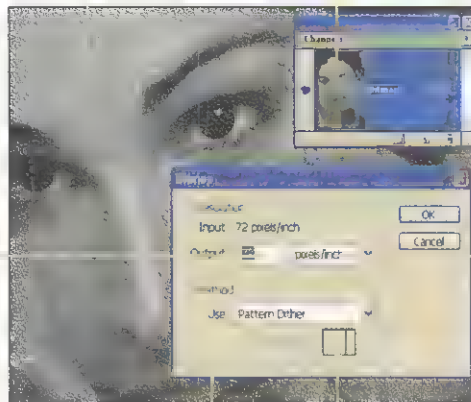
will subsequently be photocopied in large numbers, converting images to Bitmap ensures they'll copy well.

## HALFTONE DITHER METHODS

This grainy greyscale effect is actually made up from a pattern of solid black dots applied using the Diffusion Dither method.

The Bitmap will be generated at the size and resolution indicated under Image > Image Size unless you enter a different value here.

The Method drop-down menu includes a 50% Threshold method, various preset and custom patterns, and a Halftone Screen option.



Like Grayscale mode, Bitmap mode maintains the image within a single channel, but using just two colours – black and white.

Here you can choose between resolution values which relate to pixels per inch or pixels per centimetre, depending upon your output device.

Choosing the Custom Pattern method activates this pop-up, showing the various pattern presets that you've set up in Photoshop.

# Working with Duotones

Transform plain grey photos into tinted artwork, even when you only have two ink colours

**D**uotones are greyscale photos with an extra 'spot' colour which follows the greyscale toning. In other words, both colours of a duotone work together to reproduce the full tonal range of the photo, rather than one just acting as a flat tint over the top. If you're working on a strict two-colour design, duotones offer more visual interest than plain greyscale photos.

The Duotones feature also enables you to generate three-colour results (tritones) and four-colour results (quadtones). Which ink colours you

want to use is up to you: Pantone or other library inks, Photoshop's Color Picker, or even the CMYK process colour set if you want.

A conventional duotone, tritone or quadtone uses black ink as its first colour, ensuring rich, dark shadow areas along with spot-tinted midtones (see Chapter 5 to learn more about tonal adjustment), but you can use any other colour instead if you prefer. Just bear in mind that using rich hues for the spot colours such as royal blues and deep purples will darken the photo quite a bit.



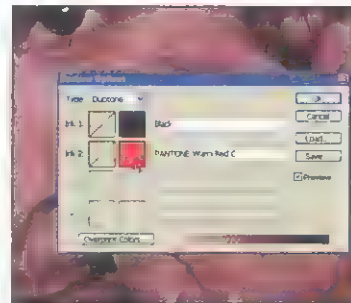
## Spot colours

*In the days when process colour printing (CMYK) was very expensive, designers would create publications printed primarily in black, with one or two coloured inks for highlighted headlines, simple graphics and so on. These are known as 'spot' colours to distinguish them from process colours. The Pantone colour libraries in Photoshop, for example, are spot inks.*

## CREATE A DUOTONE NOW

Photoshop duotones are easier to produce than you think

Begin by converting a colour photo to greyscale using the Image > Mode > Grayscale command. Then choose Image > Mode > Duotone to open the Duotone Options dialog window. By default, this reveals that you have a black-only Monotone. Click on the Type drop-down menu in the dialog window and choose Duotone. This activates Ink 2. Click on the white square and use the Color Picker or custom colour libraries to select a colour for this ink. If the Preview option is ticked in the Duotone Options window you'll see a live preview of each colour you try – click OK to select one. Give Ink 2 a name if necessary and click OK again.



**Click on the right-hand square to edit the spot colour; click on the left-hand square to alter its Curve (see page 61)**

# Indexed Color mode

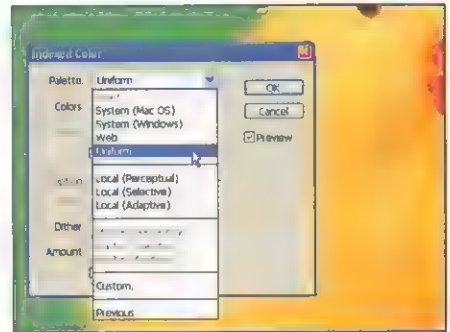
Reduce the number of different colours in an image to produce smaller files for websites



## Web formats

When your aim is to create the smallest possible GIF format graphics for a website, you'll achieve more success using the **File > Save For Web** command instead. This lets you preview various colour tables and dither options to find the optimum setting. You can also customise individual colours in the **Color Table**, within the **Optimize palette** in the **Save For Web** window.

We've seen that greyscale photos are single-channel 8-bit images whose pixels can be any of 256 different grey values. An indexed colour image is similar, in also being a single-channel 8-bit file, but in this instance the pixels can be any of 256 different colours. With a colour picture open, just use the **Image > Mode > Indexed Color** command. This opens the **Indexed Color** dialog window, within which you select your preferred options for the conversion. You can even choose to have fewer colours than the full



The **Palette** drop-down menu in the **Indexed Color** dialog window lets you choose from a variety of preset and custom colour tables

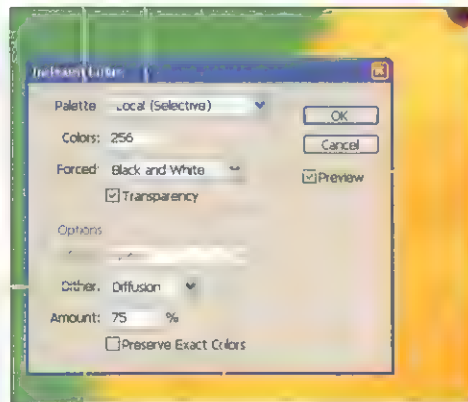
256 supported. The fewer the colours, the smaller the file will be when saved as a GIF, PNG or TIF.

## MASTERING INDEX CONVERSION

Choose a palette type, whether preset in the system, locally derived from the image itself, or a custom palette using the **Color Table**.

Dithering simulates gradients and continuous tones using a small number of colours, so helping to preserve the photographic look of the original image.

If Dithering is enabled, increasing the **Amount** value enhances the dither effect, although this will increase the file size as well.



Any number between 2 and 256 can be entered here, although you can add more colours later if you choose less than 256 now.

Determine whether certain colours must be included in the **Color Table**, such as black and white, primary colours or custom selections.

The **Matte** pop-up lets you pick a background colour to fill anti-aliased edges next to transparent areas (a web-specific feature).



# Editing Color Tables

The Color Table for an Indexed Color mode image can be edited, saved and used again

Once a photograph has been converted to Indexed Color mode its pixels are restricted to a certain number of colour variants – 256 or less. Those colours that are being used in a particular image are presented in Photoshop as a collection of swatches within a single window, so that you can see the spread of colours and optionally adjust them on an individual basis. To open this window, use the menu command **Image > Mode > Color Table**.

Editing colours one by one in a

256-colour image might seem futile, but it can be helpful for eliminating ugly banding effects by adjusting a few colours of a similar hue, for example. Bold graphics with a small number of colours, or screenshots for a training manual perhaps, can be edited very effectively this way. Ordinarily you might try to use the Magic Wand Tool progressively with the [Shift] key depressed in order to select a specific colour repeated throughout a graphic, but using the Color Table you can alter that colour globally in one go.



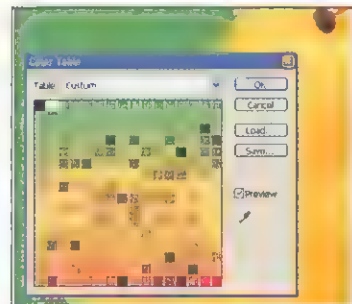
## Correct your errors

It's easy to make mistakes when editing colours in the Color Table, especially if you've inadvertently left the transparency Eyedropper Tool active. As with many other Photoshop dialog windows, hold down the [Alt] key ([Option] on a Mac) and the Cancel button changes to a Reset button. Click this button and all your edits will be reverted to their original state without you having to close the window.

## HOW TO DO IT

### Get up and running with Color Table editing straight away

To edit a colour in the Color Table, just click on its swatch square to call up the Custom Color or Color Picker window (you can toggle between them). To specify one colour to be transparent, before saving to GIF format for example, click on the Eyedropper in the window and either select a swatch or click somewhere in the main image window. Remember to click again on the Eyedropper when you've finished in order to deactivate it. Use the Save and Load buttons to save the current table for applying to images which you might convert to Indexed Color mode in future. Standard system tables can be applied from the Table drop-down menu.



**All the different colours you can see in an image can be edited and applied globally within the Color Table window**

# Multichannel colour mode

Although rarely used, this colour mode offers the potential for creating unique colour effects



## Photoshop DCS only

As well as having limited uses, Multichannel mode images can only be saved to Photoshop's own native file formats or the DCS 2.0 format. DCS 2.0 is a high-end PostScript-based colour format supported by professional page layout programs such as Quark XPress and Adobe InDesign, but little else. This is a good indication of who Multichannel mode is really aimed at.

Designers preparing graphics for colour separation normally use conventional file formats. However, sometimes it may be necessary to pre-separate the image in order to make it easier for a repro house or printer to output films or press plates correctly. If your printer expects all standard images to be supplied in CMYK colour mode, for example, he'll probably want all spot-colour images in Multichannel mode.

Multichannel can also be employed helpfully for on-screen proofing of duotones, since the Duotones feature



Converting a duotone to Multichannel mode enables you to view and edit the spot ink channels individually and in combination

in Photoshop doesn't let you view individual plates. Just remember to Undo the conversion after proofing.



## No going back

Unlike many of the other colour modes available in Photoshop, converting an image to Multichannel mode is a one-way trip. Once it's in Multichannel mode, the Image > Mode submenu is all but greyed out. Your only option (other than to Undo) is to select one of the channels in the Channels palette, convert it to greyscale under the Image > Mode submenu and discard the other channels. You can then convert it to RGB, or another mode.

## WHAT HAPPENS WHEN CONVERTING

**COLOUR CHANNELS** in the original image become spot colour channels. Each channel's 256-step greyscale values are based on the colour values of the original pixels.

**SWITCHING A CMYK** image to Multichannel mode simply converts the existing process colour channels to cyan, magenta, yellow and black spot channels. There may be no visible change to the image's appearance.

**SWITCHING AN RGB** image to Multichannel mode converts the red, green and blue channels directly to cyan, magenta and yellow spot channels respectively. There will be an obvious shift in colour appearance.

**SIMPLY DELETING** any single channel while in RGB, CMYK or LAB colour mode will automatically convert the image to Multichannel mode.

**INDEXED COLOR** mode images cannot be converted to Multichannel mode unless you switch them to RGB, CMYK or LAB mode first.

# The gamma principle

This is the concept of highlights, midtones and shadows that apply regardless of colour mode

**B**efore leaving the topic of colour modes in Photoshop, it's worth mentioning a topic which many people consider to be related: gamma. In fact gamma is an entirely different issue, and is one of the very few colour adjustments available to all colour modes in the program, but it's often lumped in with colour modes thanks to confusing scanning software. So let's get it straight.

Gamma is a measure of contrast in an image, most commonly specified as a single value for the precise midpoint between shadow (black)

and highlight (white). Gamma is represented in photo-editing software in a variety of ways. Increasing the gamma value makes the midtones brighter, while lowering it darkens the image, without affecting the extreme shadows and highlights.

Photoshop lets you adjust gamma using Levels and Curves. The gamma setting of a computer display, for example, is actually a simple contrast-correction Curve; it's the way in which the brightness of an image is interpreted by the computer and reproduced on-screen.



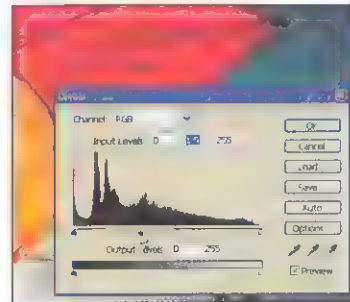
## No colour management

If you haven't enabled colour management in Photoshop, but are preparing images for press output, you can still help your output bureau by telling them the gamma settings you used. Typically they'll want to know your display gamma (usually 2.2 under Windows or 1.8 for a Mac) for edited images, and the gamma setting applied by your scanner for scanned images.

## GAMMA COMPENSATION TECHNIQUE

### How to correct scans with automatic gamma correction applied

The software provided with some scanners may impose automatic gamma correction. Use the following technique to return scans to their 'correct' gamma so they can be adjusted properly using Photoshop tools. Open the scan and use the Image > Adjustments > Levels command to call up the Levels dialog window. The centre value '1.0' next to Input Levels determines the gamma. Enter the compensation value, which is calculated as 1.0 divided by the scanner's gamma correction. An sRGB scanner under Windows, for example, might apply a gamma of 2.2, so  $1/2.2 = 0.454$ . Enter the relevant value in the box and click OK.



Photoshop's Levels window represents 'colorimetrically correct' gamma for midtones as 1.0, but you can alter this



# WORKING WITH THE COLOUR INTERFACES

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Take a tour of the tools, dialog windows, palettes and other program features which let you work with colour in Photoshop, and learn how to make the most of the key functions

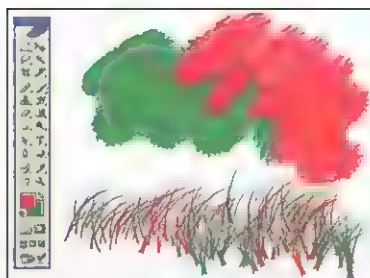
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**O**ver the years, photo-editing programs have grown ever more sophisticated. Image enhancement and retouching functions are now complemented by realistic paint tools and website features. We'll assume you know the basics of zooming, scrolling, making selections and so on. Instead, this chapter will focus exclusively on key elements within the Photoshop interface that deal with colour.

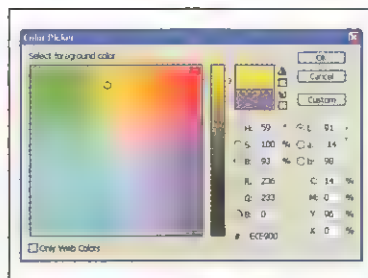
### Colour picking

One of the principal concepts in Photoshop is that of Foreground and Background colours. The Foreground colour is the one applied

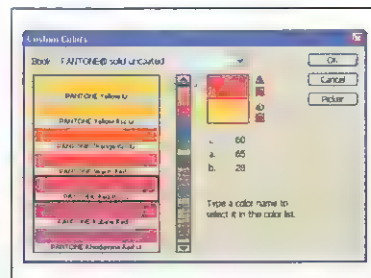
by default to the canvas when you're painting with the Brush tools, filling a selected area, drawing a vector shape and so on. The Background colour functions both as a background revealed by erase tasks and as a second-choice colour, allowing you to toggle back and forth between Foreground and Background interactively. This system of dual frontline colours permeates Photoshop, from the Color palette through the Brush tools to all other interface elements that deal with colour. By way of example, page 39 shows you how to build multi-step, multi-colour and multi-opacity gradient fills,



**Page 32** See how to apply Foreground and Background colours to an image



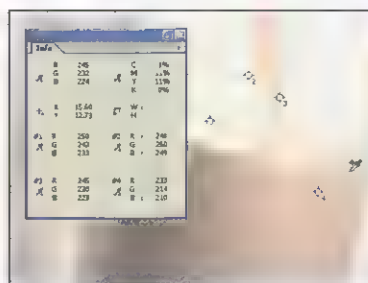
**Page 33** Get a grip on the features within the Color Picker dialog window



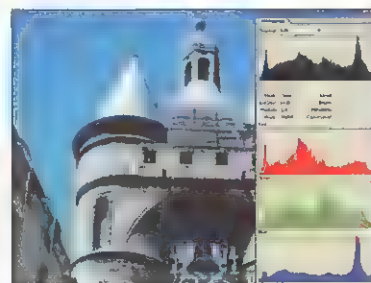
**Page 34** Browse industry-standard spot and process colour libraries in Photoshop



**Page 39** Create your own multi-step gradient fills with non-linear midpoints



**Page 41** Analyse your image during adjustment using the Color Sampler



**Page 43** Learn to decipher histograms and see what really needs correcting

beginning with the Foreground and Background default colours and then progressively adding your own.

## Well-stocked libraries

Photoshop is supplied with a variety of built-in colour libraries recognised by the pre-press and design industries. This means you can pick preset colours from the library of your choice – for example from a Pantone set, having selected the colour from a printed Pantone swatch book – and use it straight away. You'll still need to ensure that spot ink colours from these libraries are subsequently output to spot separations on a printing

press, but we'll explain further this on page 34.

Rounding off this chapter is a run-through of Photoshop's colour analysis features. This includes a demonstration of how to use the Color Sampler tool in conjunction with the Info palette to keep track of shifts in colour pixel data in specific image areas. There's also a very useful guide to reading histograms, which will stand you in good stead when you move on to advanced Levels adjustments in Chapter 5. Hopefully all this will open up areas of the Photoshop interface you were previously uncomfortable with, or perhaps never even knew existed!

# Foreground and Background

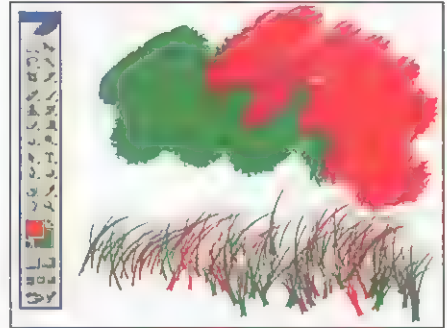
Keep two colours available at once for instant use with the Fill commands and Brush tools



## Brush colour jitter

To create artistic brushes which incorporate both the Foreground and Background colours within the same stroke, open the Brushes palette and pick any of the existing styles from the Brush Presets. Add a tick next to Color Dynamics and drag the Foreground/Background Jitter slider to the right.

Photoshop is unusual among graphics programs for its Foreground and Background colour feature. In addition to the various colour selection palettes and dialog windows, the program maintains two specific colours in the Tools palette for use at any time. The Foreground colour is the default when painting with the brushes and filling selected areas. The Background colour comes into play when erasing pixels from an image, or it can be used as a second Foreground colour by using the



The two colours can be used separately with conventional brushes, or mixed together when you use certain art brushes

Switch Foreground and Background Colors command, explained below, to swap the two colours around.

## TOOLS PALETTE QUICK REFERENCE

The colour selection area of the Tools palette is sandwiched beneath the main editing tools and above the masking and program interface buttons.

The top-left swatch square is always the Foreground colour. Click on it once to open the Color Picker dialog window.

Click on the Default Foreground and Background Colors button to revert the two back to plain black (Foreground) and white (Background). The keyboard shortcut is [D].



When you want to use the Background colour as the Foreground colour, click on the Switch Foreground and Background Colors button. The keyboard shortcut is [X].

The bottom-right swatch square is always the Background colour. Click on it once to open the Color Picker dialog window.

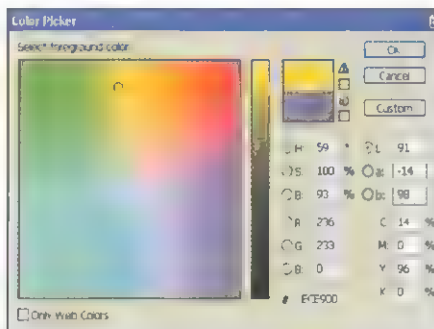
Both colour squares can pick up new colours from the Color and Swatches palettes, and when image pixels are selected with the Eyedropper tool.



# Working with the Color Picker

Photoshop's main interface for choosing colours is the Color Picker dialog window

The Color Picker lets you choose colours visually or numerically. That is, you can enter numeric values in either HSB, RGB, LAB or CMYK colour modes, or use the colour field and gradient bar. Web designers can also enter hexadecimal figures for web-safe colours, and tick the Only Web Colors option. The Color Picker additionally presents swatches of the current colour selection alongside its original, pre-edited state for reference. If a warning triangle icon appears, your chosen colour won't be reproducible in CMYK mode;



The selected colour is indicated by a circle in the large colour field and a position in the vertical gradient bar next to it

if a warning cube icon appears, the selection is not a web-safe colour. Click on the icon to fix the problem.



## Other colour pickers

If you feel happier using the Windows or Mac OS built-in colour pickers, Photoshop can be set up to use them instead of its own. Type [Ctrl]+[K] (iCommand)+[K] on the Mac) to open Photoshop's General Preferences, then choose Windows (or Apple) from the Color Picker drop-down list and click OK.

## HOW TO DISPLAY THE COLOR PICKER

**CLICK ONCE** on the Foreground or Background colour squares in the Tools palette.

**CLICK ONCE** on the Set Foreground Color or Set Background Color squares in the Color palette. Note that you may have to click twice, since an initial click may be required to make the desired square active.

**DOUBLE-CLICK** on a shadow-midtone-highlight Eyedropper button in either the Levels or Curves dialog windows, or in certain other colour and tonal adjustment windows.

**CLICK ONCE** on the colour button which appears in the Options bar along the top of the screen when the Type, Pen or Shape tools are active.

**WHENEVER** you see a square colour button in a window, such as in Image > Adjustments > Photo Filter or when using the Gradient Editor (see page 39), you can click on it to call up the Color Picker.



## Multi-mode values

No matter which colour system – HSB, RGB, LAB, CMYK or hexadecimal – you use in the Color Picker, values for the colour you choose are shown in all the other modes simultaneously. This can be handy for comparing RGB and CMYK equivalents, for example, or for working out the HSB value of a web-safe hexadecimal.



# Custom Color libraries

Choose ready-made spot ink and process colours from various industry-standard libraries



## Library contacts

For more information on Pantone's spot ink and process reference libraries, go to [www.pantone.co.uk](http://www.pantone.co.uk), and for an interactive multimedia presentation on how the TruMatch colour library works, go to [www.trumatch.com](http://www.trumatch.com). Learn about colour consistency in print with Focoltone at [www.focoltone.com](http://www.focoltone.com). Details of the Toyo Color Finder can be found at [www.toyoink.com](http://www.toyoink.com).

There's a button in the Color Picker dialog window labelled Custom. When you click this button, the window switches to the Custom Colors dialog. The terminology is a bit confusing, because what this window actually offers you is a set of predetermined colour libraries – if you want to 'customise' your own colours, you would use the Color Picker, of course.

Still, the Custom Colors window provides access to a vast range of spot ink and process mixes that are recognised internationally by the

printing industry, including Pantone, Focoltone, TruMatch, HKS, ANPE, DIC and Toyo. Choose the library you want from the Book drop-down list and then scroll through the available colours. If you already know the number of the colour you want, type the number to select it.

Note that the Custom Colors window continues to provide before/after samples when editing an existing Foreground or Background colour, as well as warning icons for out-of-gamut colours and those which are not web safe.

## CREATE SPOT COLOUR SEPARATIONS

### Make sure your Custom Color selections print out properly

Custom Colors are printed using the standard process colours CMYK, even if the colour you chose was from a spot ink library such as Pantone Solid. To ensure the colour outputs to its own spot separation, it must be used within its own spot colour channel. To do this, convert your image to CMYK mode, then add a new channel to the Channels palette. Use your chosen Custom Color only within this new channel; you can make selections in other channels, but the colour itself should only be added to the new one. The image should be saved in Photoshop DCS 2.0 format if the file is to be printed outside of Photoshop or exported to a page layout program.

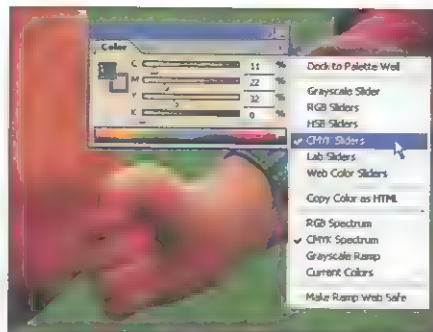


**Spot ink mixes will output as CMYK unless you restrict each spot colour to its own channel**

# Using the Color palette

Create and adjust individual colours on the fly using slider controls and a spectrum bar

The Color Picker window in Photoshop is pretty clumsy; it fills your screen and prevents you from working on your image until the dialog has been dismissed. Thankfully, you can create and edit colours on the fly using the Color palette, opened from the Window menu or with the keyboard shortcut [F6]. Colours can be adjusted using sliders and numeric values, or you can pick them interactively from a small, representational spectrum bar at the bottom of the palette. You can also set Foreground and Background



Note that a Color palette can display adjustment sliders for one colour model while showing a spectrum bar for another model entirely

colours within the palette – these choices will apply to the Tools palette, and throughout the program.



## Spectrum bar toggle

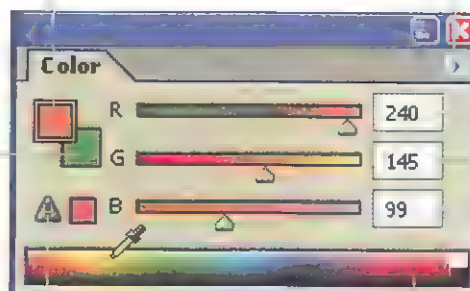
Normally you choose which spectrum bar to display in the Color palette by selecting it by name in the palette menu. As a shortcut, you can also toggle between them in order by clicking inside the spectrum bar while holding down the [Shift] key. Each Shift-click toggles to the next spectrum ramp in the menu, then back to the first one again.

## CHOOSING COLOUR ON THE FLY

Click on the Set Foreground Color square so that the colour you create and edit is applied as the new Foreground Color throughout Photoshop.

Likewise, click on the Set Background Color square to make it the target for the new colour you want to create.

Out-of-gamut (triangle) and web-safe (cube) warning icons appear here when appropriate. Click on them to adjust the colour and fix the problem.



The palette menu lets you choose between Grayscale, RGB, HSB, CMYK, LAB and Web Color sliders, plus a Web Safe option for the spectrum bar.

Use intuitive slider controls to adjust the colour in your chosen colour mode, or enter numeric values in the number fields to the right.

Click anywhere on the spectrum bar to pick up new colours. Plain black and white swatches are available on the right.

# Save colours to Swatches

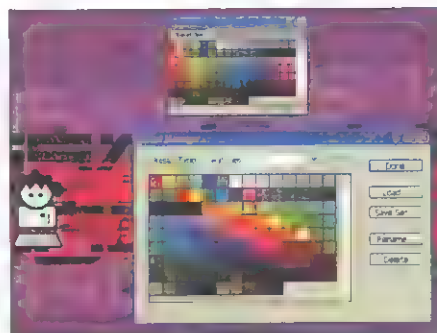
Keep a larger range of colours handy in the Swatches palette for immediate use



## Save custom library

When you add new colours to the Swatches palette, they will be remembered the next time you run Photoshop. However, they'll be lost if you load another library to the palette using the **Replace Swatches** command under the palette menu. To avoid this, use the **Save Swatches** command to permanently record the customised library that you've created.

Working with just two colours – a Foreground and a Background – is a bit restricting, and having to keep returning to the Color Picker and Custom Color dialog windows, or the Color palette, to switch to other colours is fiddly. If you intend using a number of different colours repeatedly, keep them available in the Swatches palette. The palette also acts as a ready-made colour picker, and can be used to keep Custom Color libraries on-screen as swatches or as a helpful scrolling list. Custom



Use the **Preset Manager** command under the Swatches palette menu to edit individual colours within the current library or a saved set

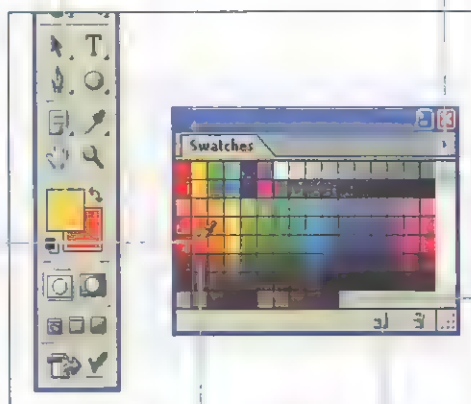
swatch collections, no matter how small, can be saved for use on related editing jobs in the future.

## HOW SWATCHES WORK

Create a new Foreground colour with the Color Picker, Color palette or Eyedropper Tool and add it to the Swatches palette.

Click on any of the swatch squares to set it as the new Foreground Color. This also updates the Foreground Color in the Color palette.

Hold down the [Ctrl] key ([Command] on a Mac) and click on a swatch in order to set the Background Color.



The palette menu enables you to load more swatches, including Custom Color libraries, and optionally view them in list format with names.

Click on an empty area to add the current Foreground colour to the palette as a new swatch. Remember to give it a name.

As an alternative to the shortcut above, click on the **Create New Swatch** button to add the current Foreground colour to the palette.

# Paint Bucket fills

The Paint Bucket works like a Magic Wand and Fill command combined for fast recolouring

Photoshop features a one-step alternative to recolouring areas of an image by using the selection tools and Fill commands: the Paint Bucket Tool. However, the Paint Bucket in Photoshop works in quite a different way to similar-looking tools in other graphics programs.

Rather than simply dumping the current Foreground colour into a pre-selected area of an image, the Paint Bucket determines the area to be recoloured automatically. It does this by analysing the colour value at the point where you click

in your image and then applying the fill action to this point and to other pixels in the image which have similar colour values.

In this respect, the Paint Bucket essentially does the job of a Fill command and Magic Wand tool combined into one. As with the Magic Wand, therefore, you'll need to adjust the Paint Bucket's sensitivity in the Options bar. The tool's options include the ability to recolour areas with custom patterns and apply fills with transparency blending modes.



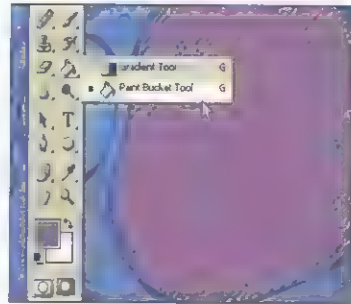
## More fill options

Use the **Edit > Fill** command to access more advanced options when filling an area with colour. You must, however, use selection tools to designate the area you want to fill. If you've made a selection, you can also fill it with the Foreground colour using **[Alt]+[Backspace]** (**[Option]+[Backspace]** on a Mac) or with the Background colour using **[Ctrl]+[Backspace]** (**[Command]+[Backspace]** for Mac users).

## RECOLOUR PIXELS WITH EASE

Here's how to use the Paint Bucket tool quickly

Specify a Foreground colour using the Color Picker or Custom Color dialog windows, or by creating a colour in the Color palette or picking one from the Swatches palette. Choose the Paint Bucket Tool in the Tools palette (the shortcut is **[G]**, or **[Shift]+[G]** to toggle from the Gradient Tool). Click on the area of the image you want to recolour. If too much of the image is filled, use the **Edit > Undo** command, reduce the tolerance value shown in the Options bar at the top of the screen, and try again. If you want to restrict the fill to a single area, rather than applying it throughout the image, tick the **Contiguous** option, also in the Options bar.



**The Paint Bucket tool can fill selections, but will also fill pixels of a similar colour without an area being selected**



# Using the Gradient Tool

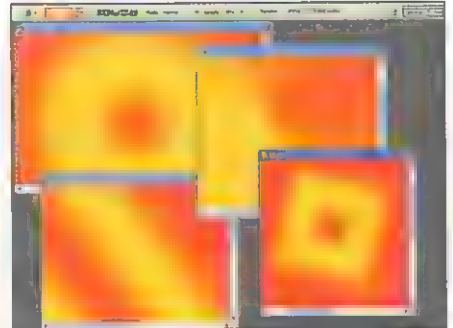
Apply smoothly-blended colour gradients to images, selections, layers and masks



## Contextual presets

Several of the preset choices in the Gradient Picker have been designed to make use of the current Foreground and Background colours. Changing the Foreground and Background colours will therefore update the look of the gradients available to you. So, before editing one of the default gradients in the Gradient Editor, check whether all you actually need to do is change the two colours in the Tools palette.

Colour gradients are added by clicking and dragging across the image window with the Gradient Tool. The extent to which you drag – that is, a long or a short distance – determines the transition ‘speed’ of the gradient blend. Unless you have a selection active in the image, the gradient fills the whole image or current layer. Using the Options bar controls, any gradient can be reversed in direction, made transparent, and applied with any of Photoshop’s transparency blending modes. These gradients can also be



The same tool can produce custom Radial, Angle, Reflected and Diamond gradients, in addition to the conventional single-direction linear style

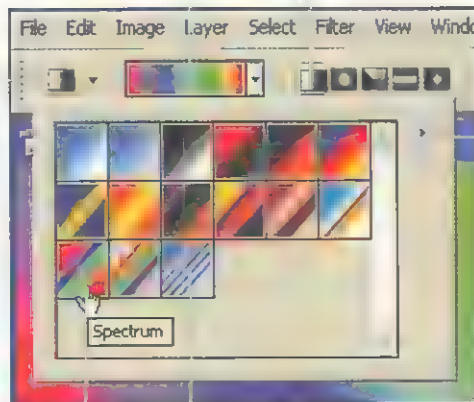
used as greyscale layer masks for blending between layers and creating double-exposure effects.

## GRADIENT CONTROLS EXPLAINED

This is the gradient preview. Click on it to launch the Gradient Editor, so that you can customise its colour and appearance.

As with all Photoshop tools, all the settings in the Options bar can be saved as a tool preset for easy recall from this pop-up.

Click on a swatch in the Gradient Picker to load it into the Gradient Tool. Hover over a swatch to see its name.



Five different gradient styles are provided in Photoshop. You can toggle between them using these buttons on the Options bar.

The palette's menu button gives you access to further gradient sets, as well as enabling you to change the swatch view to a list view.

Right-click ([Control]-click on a Mac) on any swatch to call up a context menu for renaming and deleting gradients, or creating new ones.

# Create your own gradients

Editing gradients and designing new ones is easy with Photoshop's built-in Gradient Editor

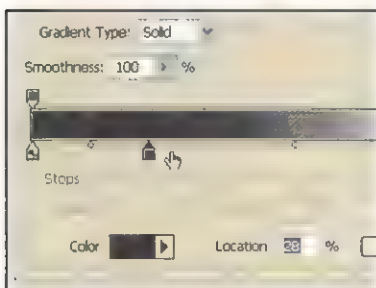


Select the Gradient Tool and click directly on the gradient preview in the Options bar (not the menu arrow next to it). This opens the Gradient Editor dialog window. Pick a gradient swatch you wish to edit by clicking on it – we've chosen the plain Foreground to Background gradient. Click on the New button so that you're working on a duplicate of the gradient, not the original.

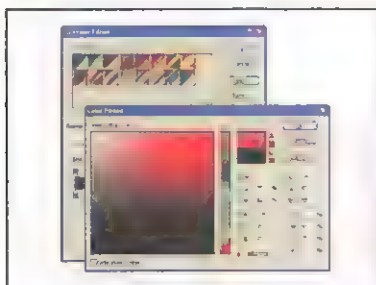


## Reset default

While in the Gradient Editor, hold down the [Alt] key ([Option] on a Mac). This temporarily turns the Cancel button into a Reset button. Clicking on Reset causes the gradient currently being edited to revert to the plain Foreground to Background default gradient, regardless of whichever gradient swatch set you have loaded.



Click once underneath the gradient ramp bar. This adds a new 'colour stop' to the ramp using Photoshop's current Foreground colour. This colour stop can be repositioned along the ramp by dragging it left and right. Between each pair of colour stops is a midpoint diamond symbol. These midpoints can also be dragged left and right to adjust the gradient's appearance.

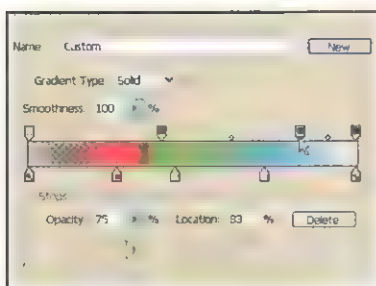


With a colour stop selected, click on the Color rectangle below the gradient ramp bar. This launches Photoshop's Color Picker, from which you can choose an alternative mix to the default Foreground colour. Each colour stop can be recoloured this way. Alternatively, select a colour stop and click on the Foreground colour square in the main Tools palette to launch the Color Picker.



## Lots of noise

Click on the Gradient Type pop-up list in the Gradient Editor and change the selection from Solid to Noise. Noise gradients are made up of large numbers of multiple colour steps, producing random, organic-looking patterns of fine strands. Use the colour sliders and Randomize button to generate an infinite variety of noise gradients. They look especially impressive applied to the Angle gradient style.



Click above the gradient ramp bar. This adds a new 'opacity stop' to the ramp. With this opacity stop selected, make it partly or fully transparent by entering a percentage less than 100, or by using the pop-up slider next to Opacity below the ramp. In this way you can build a gradient comprised of interacting colours and variable transparency.

# Analysing colour values

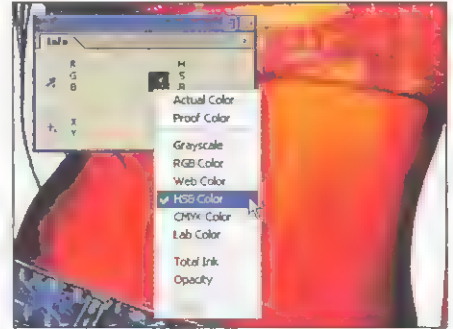
See the breakdown of colours in an image easily by checking the Info palette readout



## Index numbers

When working in Indexed Color mode, the Info palette additionally shows each pixel's index number between 0 and 255. If you open the Color Table, you can use the Info palette to find out which colour has been assigned which number by passing the mouse over them. Any change you make to a colour is indicated as a pair of before-and-after values separated by a slash, for example '245/137'.

Colour corrections sometimes go awry because you're unable to identify the cause of the problem that you're trying to correct. For example, an image which seems to lack warmth may have its red channel Levels already at maximum: the solution would be to reduce the green and blue channels instead. The Info palette will reveal this kind of information without interrupting your work. When the palette is open, pixel colour values are displayed as you move your mouse around an image. The palette can show RGB,



Toggle the Info palette's display values between Photoshop's various colour modes so you can compare different modes against each other

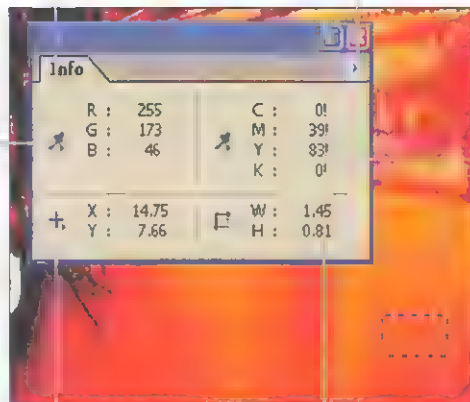
CMYK, HSB, Web, LAB and Grayscale values, regardless of the colour mode of the image itself.

## INFO PALETTE DETAIL

The top section of the palette is reserved for colour breakdown figures, which refer to whichever pixel lies under the mouse pointer.

To change either of the pair of colour modes displayed, click on the Eyedropper button to call up a list of alternatives.

The bottom-left section displays the x and y co-ordinates of the mouse pointer. Click on the crosshair button to change the measurement units.



Colour readouts and mouse co-ordinate units can also be selected from an Options dialog window opened from the palette menu.

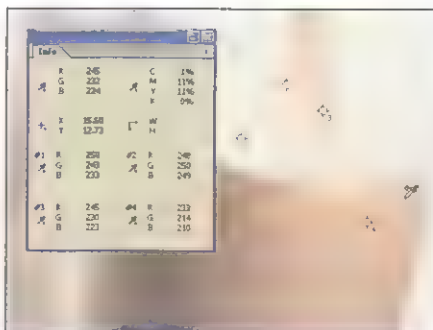
When a pixel's colour is out of gamut for printing, the CMYK values displayed are nearest approximations, accompanied by exclamation marks to warn you.

The bottom-right section shows the width and height of the current section. If nothing has been selected in the image these values are blank.

# Expert colour sampling

Copy and re-use colour, and pinpoint the effect of adjustments right down to local pixel values

One extremely useful way of choosing colours is to sample them from an image itself using the Eyedropper Tool: just click anywhere in the image to copy the colour of the pixels underneath to Photoshop's Foreground colour. You could use this feature when retouching a photo, sampling the colour from one area to apply elsewhere. Pressing the keyboard shortcut [Shift]+[I] switches to a special Eyedropper tool known as the Color Sampler, which plots up to four fixed locations in your image and displays their colour



Color Sampler locations are saved within the image, so you can refer back to them even after closing and reopening the file

values in the Info palette. You can then track changes as the image is subsequently colour-corrected.



## Eyedropper shortcuts

Hold down the [Alt] key ([Option] on a Mac) when clicking on an image with the Eyedropper Tool in order to set Background colour instead of the Foreground colour. You can also hold down the [Alt] ([Option]) key while using any of the paint tools to toggle temporarily to the Eyedropper Tool without having to return to the Tools palette.

## COLOR SAMPLING STEPS

- ENSURE** that the Info palette is open and that you've selected the Color Sampler tool.
- FIND AN AREA** of colour that you want to analyse and track, then click once on it with the Color Sampler. The tool deposits a crosshair target symbol on the image labelled '1' and adds its colour data to the Info palette alongside the label '#1'.
- CLICK ON** another area to sample, and repeat this process two more times if you want to create up to four targets in the image, each with their colour values displayed in the Info palette.
- CAREFULLY CLICK** and drag on any crosshair target with the Color Sampler tool in order to move it to a new location in the image.
- DELETE** a target by right-clicking on it ([Control]+click on a Mac) and choosing Delete from the context menu.



## Sample size

If you're working on an image with visual noise or film grain, the Eyedropper may not pick up the pixel colours you expect. Compensate for this by increasing the tool's Sample Size in the Options bar from Point Sample to either 3 by 3 Average or 5 by 5 Average. This picks up an average colour calculated from the 9-pixel or 25-pixel area around the pixel you clicked on.



# Introducing histograms

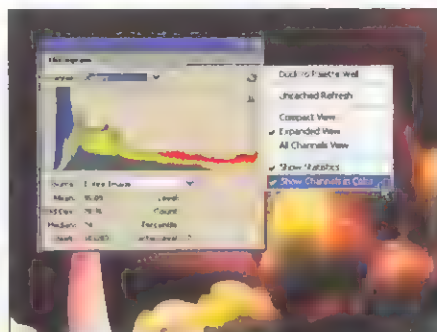
Make an at-a-glance analysis of an image's colour intensity to help you target problems



## Broken graphs

Colour editing and image enhancement is a destructive process which sacrifices colour data in order to salvage the overall image. This data loss is represented as gaps and thin spikes in the histogram. If an image's histogram is starting to look very gappy and ragged, avoid making any more edits, or at least keep them subtle.

Pixel colour intensity is an important measurement of an image's visual correctness. To save you having to interpret the numbers, Photoshop maps the data into a graphic known as a histogram, which is viewable as a composite for the whole image, or individually for each colour channel component. A histogram can tell you a lot about the colour content and tonal balance of an image – it's like a quick version of the full Levels dialog window without any adjustment controls. While the Info palette shows pixel



The floating Histogram palette in Photoshop CS5, with its simultaneous channel display, should encourage greater use of graphic data

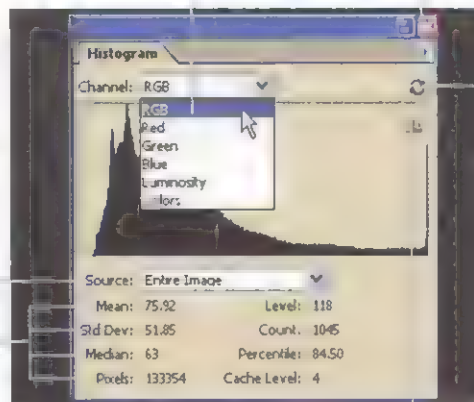
colour detail, a histogram is a potted report on the whole image, revealing peaks, troughs and clipped areas.

## GUIDE TO THE HISTOGRAM PALETTE

Use the Channel menu to view image data channel-by-channel, rather than as a composite. This is helpful for identifying colour casts.

The Source menu will remain greyed out until you add layers to an image, whereupon you can choose to view histograms for selected layers.

These statistics all refer to the intensity values of the pixels in the image (or layer), and more specifically of those under the mouse pointer.



Expand and contract the palette, show or hide the statistics and reveal all channels simultaneously using commands under the palette menu.

When the histogram is based on cached data, rather than live data, this symbol becomes active. Click on it to refresh the histogram view.

A histogram drawn from cached data will also display this warning triangle. Click on it to redraw the histogram from live data.

# Histograms put into practice

To give you a better understanding of what histograms are showing you, here's a guide



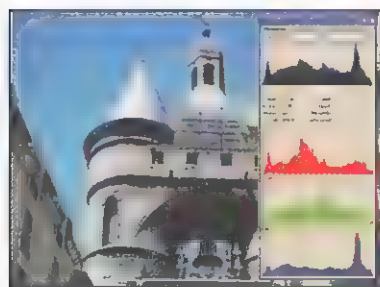
**1** Every histogram will look different: there's no fixed rule for what is a good or bad graph shape. However, the histogram here appears to be huddled up towards the left, indicating that most of the pixels in the image have a low or average intensity, and that the image is comprised of shadows and midtones. This is a classic indication of an underexposed photo.



**2** In this instance, the opposite is true. The photo looks pale in comparison to the one above and the histogram explains why: most of the pixels bear a high intensity, with plenty of highlights and midtones but few rich darker areas and apparently no solid shadows at all. This photograph clearly suffers from overexposure.



**3** This version of the same photo looks better, and again the histogram tells the story. Ignore the shape of the graph, though. What matters is that there's a good distribution of pixel intensity right across the tonal range, from shadows on the left to highlights on the right. Just as importantly, there's no tonal information apparently being clipped off at either end.



**4** Choose the All Channels View from the Histogram palette menu. This expands the palette to show the RGB channels separately below the composite version at the top. You can see that the blue channel's tonal range is quite different from those of the red and green channels. It tells us that the blue component is emphasised mostly near the highlights, to produce the fine blue sky.



## Check your monitor

Before charging ahead with tonal adjustments, be absolutely sure that the problem is not actually with your computer display set-up rather than the image. A monitor which has not been calibrated or profiled is unlikely to provide you with an accurate representation of colour or tonal values, especially if it's located next to a window or other bright light source.



## Dust and scratches

Blemishes in a photo will adversely affect its histogram. That is, the histogram will report back on all the pixel data it sees, including dust and scratches. You should be wary, therefore, of evaluating an image's potential for enhancement based on a histogram which contains undesirable data. Use retouching techniques to tackle these issues first.

## Chapter 4

# POWERFUL BUT SIMPLE COLOUR ADJUSTMENTS

### In this chapter...

- Carry out basic enhancements with a minimum of effort
- Discover how quality and resolution affect images
- Understand how to use the various adjustment tools
- Discover how to use the various adjustment tools

Not all of Photoshop's feature set is composed of intricate interface details. This chapter shows you how to use simple features to produce colour adjustments worthy of an expert

There will be lots of chances to investigate Photoshop's more complicated features later on in this book – let's begin with the easy stuff. That's not to say that this chapter is limited to basic tasks; on the contrary, the following pages cover some highly-advanced techniques for practical colour adjustment – they're just easy to do!

### Instant enhancement

Despite its reputation as a tool for the professional, Photoshop comes with a range of quick-fix commands to suit the beginner, while offering useful alternative approaches for busy users, and lazy ones too.

Recent releases of the program have augmented the Auto Levels feature with Auto Contrast and Auto Color commands. Together, these may be all you ever need to make colour corrections to images sourced from digital cameras and scanners. If you want fine-tuning, put them to one side, but if you want a quick but effective solution, these tools will do the trick 90% of the time. We'll even show you how to customise Photoshop's instant-fix options.

### Better colours

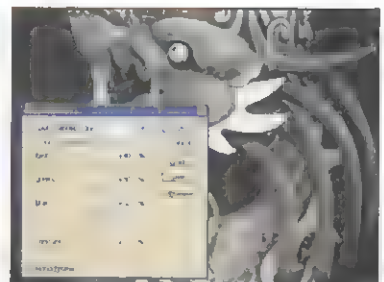
Certain features are designed to help you make whole-image colour corrections and enhancements with



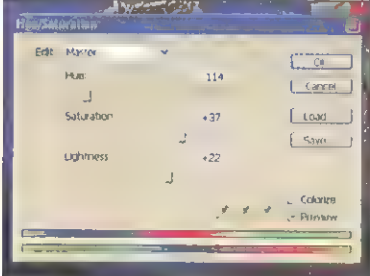
**Page 48** Dispense with sliders and use a click-select colour interface instead



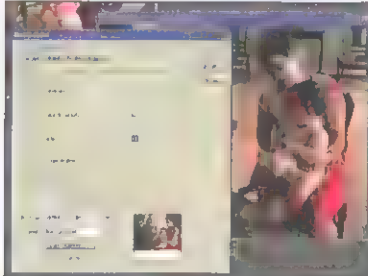
**Page 49** We show you what can be done with the Brightness/Contrast controls



**Page 51** Create superior greyscale images using the Channel Mixer



**Page 52** Learn about the fundamentals of Hue/Saturation adjustment



**Page 53** Bring back summer by turning yellow autumn leaves a healthy green



**Page 54** Learn more colour-changing tricks using the Selective Color command

a few clicks or a drag of the slider controls. These include the popular Variations feature. While Variations is pretty self-evident as soon as you see the full-colour thumbnails, we also provide complete directions on how to navigate the controls and customise the extent of the adjustments. Our many tips on dealing with colour in simple ways include our preferred method of producing rich monochrome photos from colour originals, as employed by professional photographers.

## Swap shop

Rounding off this chapter is an explanation of the easier commands

for colour-change operations – that is, ones that can swap one colour for another without affecting the rest of the image. Here you'll find hands-on tips for using the Hue/Saturation feature properly, for real-world tasks rather than for creating psychedelic nightmares as a hobby. Also covered in some depth are the Selective Color and Match Color commands, the latter being a new addition to Photoshop CS which, unfortunately, isn't available in previous versions of the program. These are not the only colour-change features in Photoshop – far from it – but we can move on to the more challenging methods later.



# Automatic colour correction

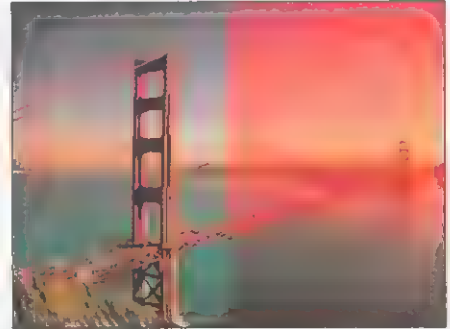
Use Auto Levels, Auto Contrast or Auto Color for an instant fix with the minimum of effort



## Auto keyboard

The keyboard shortcut for Auto Levels correction is [Ctrl]+[Shift]+[L] ([Command]+[Shift]+[L] on a Mac). For Auto Contrast, the shortcut is [Ctrl]+[Alt]+[Shift]+[L] ([Command]+[Option]+[Shift]+[L]). Auto Color is applied with [Ctrl]+[Shift]+[B] ([Command]+[Shift]+[B]).

Despite being packed with high-end features, Photoshop provides three quick-fix corrections for common problems such as colour casts, underexposure and overexposure. The Auto Levels, Auto Contrast and Auto Color commands can be found under the Image > Adjustments menu. The principle is that one of the three should offer the right solution for your image; you're not supposed to apply all three one after the other to the same image. Auto Levels and Auto Color will shift colours within the image if this



The Auto commands are ideal for when you can see something is wrong with an image but don't quite know how to fix it

is deemed necessary, while Auto Contrast simply tackles overall black-white contrast.



## Caste risk

The Auto Levels command applies itself to an image on a channel-by-channel basis. This is good when an image suffers from a colour caste, because any bias towards a certain channel will be balanced out. However, since it's a 'blind' correction – for example, it can't tell the difference between an orange caste and a photo of a bowl of oranges – the command can actually produce a new colour caste of its own.

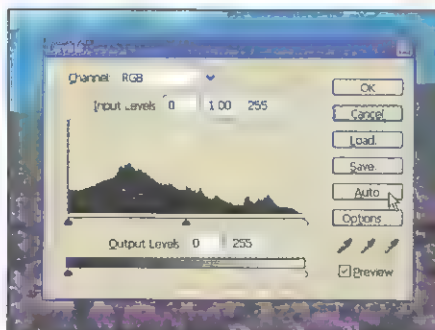
## WHAT THE COMMANDS DO

- ☐ **AUTO LEVELS** adjusts the black and white points in each channel of an image, so that the darkest pixels are 'clipped' to pure black (level 0) and the brightest pixels are made pure white (level 255). Intermediate midtone pixels are adjusted for their colour value accordingly.
- ☐ **AUTO CONTRAST** adjusts the overall contrast and mixture of colours in an RGB image as a composite, rather than on a channel-by-channel basis. Again, shadows and highlights are clipped to absolute black (0) and white (255) values.
- ☐ **AUTO COLOR** adjusts the contrast and colour of an image by clipping shadows and highlights as before to 0 and 255, while also neutralising midtones to a target value of 128 for a more measured adjustment.
- ☐ **BY DEFAULT**, a padding of 0.5% is allowed at either extreme when clipping the pure black and white pixels.

# Auto correction options

Customise how Photoshop's quick-fix Auto commands apply their corrections

The Auto correction commands tend to be insensitive to variations between images. But if you call up the Levels or Curves dialog windows, you can alter the way in which the changes are made. Clicking on the Options button in either of these windows opens a new dialog in which you can adjust the settings used by Photoshop for its Auto Levels, Auto Contrast and Auto Color commands. As well as letting you try these out interactively, as alternative Algorithms, the Auto Color Correction Options offer more



The Auto button in both the Levels and Curves dialog windows lets you apply auto correction as a 'first try' before manual adjustment

leeway for identifying blacks, whites and midtones, while reducing the 'clip' values if your scanner is good.



## Which algorithm?

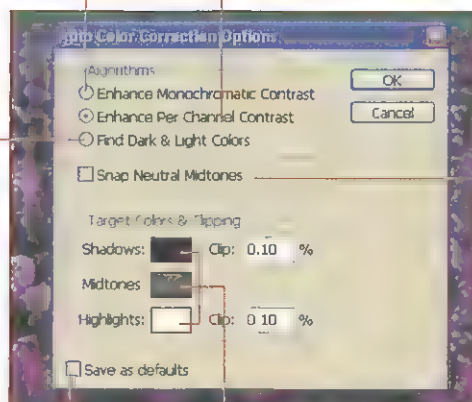
The three Algorithms listed in the Auto Color Corrections Options dialog window are equivalent to the Auto Contrast, Auto Levels and Auto Color default methods. However, your choice will be ignored when you save the settings as defaults: only the Target Colors & Clipping matters here. The only Algorithm setting to be remembered with the defaults is the Snap Neutral Midtones option, and this only applies to Auto Color.

## THOSE AUTO OPTIONS IN FULL

**Enhance Monochromatic Contrast** clips all the colour channels in an image identically. This maintains the existing colour relationship, only affecting the contrast.

**Find Dark & Light Colors** finds the average lightest and darkest pixels in an image, and uses them to maximise contrast while minimising clipping.

Tick here to save your settings as the default whenever you apply the Auto Levels, Auto Contrast or Auto Color commands in future.



**Enhance Per Channel Contrast** clips the colour channels individually in order to produce a colour-balanced result. This may remove or introduce colour casts.

**Snap Neutral Midtones** allows Photoshop to identify an average midtone in the image and assign it a neutral grey value.

Here you can decide how solid you want the blacks and whites to be when assigning the shadow and highlight points.

# Visual editing with Variations

A visual adjustment window and colour wheel principle combine for powerful colour editing



## Compounded problems

Remember that clicking on the thumbnails in the Variations window has a cumulative effect. Often you might want to increase a Variations adjustment without actually doubling it with two clicks. So, after the first click, drag the Fine/Coarse slider to the left. This will reduce the jump in 'variance' and offer a more subtle range of adjustments for the second click.

Select the command Image > Adjustments > Variations. This opens a dialog window containing multiple thumbnails of your current image. The top two thumbnails present a before-and-after reference. The large pane below shows adjusted colour balance thumbnails in a colour wheel layout. Click on the thumbnails to incrementally adjust the image. If you don't like the result of clicking on a colour thumbnail, you can simply click on its opposite colour to undo it. The pane on the right enables you to adjust contrast



The colour thumbnails are laid out in an arrangement which closely matches the principle of the colour wheel (see page 12)

independently of colour. If you lose your way, click back on the Original thumbnail at the top-left to start again.

## FINE-TUNING CONTROLS

**Select Shadows, Midtones or Highlights to determine whether you want the dark, middle or light areas targeted for the colour enhancement.**

**Select Saturation if you wish to maintain hues and brightness but increase the vividness of colours. Your thumbnail choices are simply Less and More.**

**The amount of adjustment shown by each Variations thumbnail is determined by this slider, set between Fine (small adjustment) and Coarse (big adjustment).**

☐ Shadows  
☒ Midtones  
☐ Highlights  
☐ Saturation

☒ Show Clipping

Fine
Coarse

**If you have several similar images to correct, you can use previously-saved Variations settings by loading them up here.**

**Click here to save your current Variations adjustment to a file, so that you can load and apply it to other images.**

**When Show Clipping is ticked, pixels whose colour has been pushed to its extreme values are highlighted in the thumbnails.**

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FOCUS GUIDE - ADOBE PHOTOSHOP MANAGING COLOUR

# Brightness and contrast

Alter the overall brightness and contrast for an image in one place using very simple sliders

Given the powerful functions elsewhere in Photoshop for colour enhancement, the fairly basic Brightness/Contrast command is probably included for no other reason than that all photo-editing programs have it. The problem with it is that the simple sliders apply the same adjustment to every pixel in an image in a linear fashion. In other words, making an adjustment to correct some highlights will have an equal effect on midtones and shadows alike. This is a much less effective approach than the

proportionate adjustments supported by the Levels and Curves commands explained in the next chapter. Such non-linear adjustments take into account that you want to adjust certain tonal values while leaving others alone. Because of Brightness/Contrast's all-or-nothing alteration of pixel values across the image it may be handy for achieving quick results, but you'll rarely obtain the kind of quality result you want. Even the Auto Levels, Auto Contrast and Auto Color commands will normally do a better job.



## Adjustment layers

Many commands under the Image > Adjustments menu can be applied as 'adjustment layers' which are copies of the original layer. Doing this not only makes it easy to return to the original unchanged image, but lets you use Photoshop layer masks to fine-tune which areas are affected by the edits.

## MAKE AN ADJUSTMENT

### How to use the Brightness/Contrast controls in practice

Open the Brightness/Contrast dialog window from the Image > Adjustments menu. Drag the sliders to the right to increase Brightness and Contrast, or to the left to decrease them. In general, look in the shadows and highlights to discern whether Brightness adjustment will help. Brightness can reveal detail lost in shadows, but may turn all the highlights solid white as well. Use Contrast to improve an image which seems dull and full of midtones; if it already has dark shadows or bright highlights, increasing contrast will ruin the image. Often, you'll find that an increase in one slider requires a reduction in the other to compensate.



**Brightness and contrast tend to work in opposite ways; you rarely end up adjusting both in the same direction**



# Correction with Color Balance

The Color Balance controls are handy for removing casts and boosting primary colours



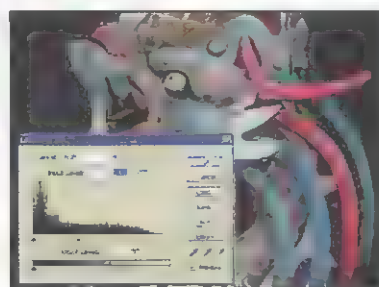
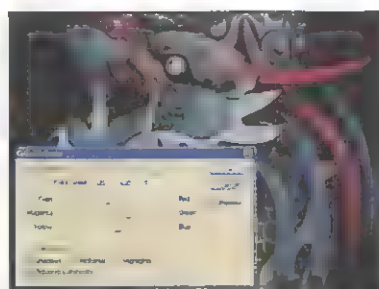
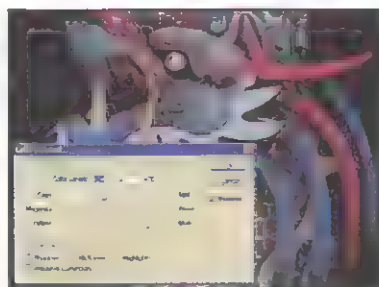
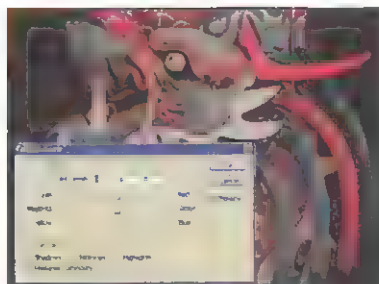
## Curves alternative

Despite its slider interface, the Color Balance feature is actually a much-simplified version of the Curves adjustment (see page 61). If you still have trouble understanding Curves after reading this book, feel free to use Color Balance instead. However, Curves enable much more versatile hands-on adjustment than Color Balance's hit-and-miss approach, and are therefore recommended for serious photographers.



## Preserve Luminosity

Ticking the Preserve Luminosity option at the bottom of the Color Balance dialog window maintains the existing tonal balance in the image. Normally, different colours adjusted separately in highlights, midtones and shadows will cause a shift in the luminosity of the affected areas. With this option ticked, this won't happen.



**1** Open the Color Balance window from the Image > Adjustments menu. Unless your image is one of extreme contrasts of highlight and shadow, begin by looking at the Midtones for colour problems. The image shown here, for example, suffers from a warm caste which, although certainly not unpleasant, is undesirable, and unfaithful to the original shot.

**2** Make sure Midtones is selected under the Tone Balance section at the bottom of the Color Balance window. Drag on the sliders in such a way as to move away from the primary colours which you believe to be causing the problem. In the example here, we've moved the sliders away from Red and away from Yellow. Don't feel compelled to adjust all three sliders just for the sake of it.

**3** Having removed the colour caste from the midtones, click on Shadows in the Tone Balance section. Now make further adjustments to the slider controls to change the appearance of dark areas. Here, we've tried to reduce the slight pinkiness of the dark background by dragging the sliders away from Red and Magenta.

**4** Be careful if you decide to adjust the Highlights, because even small shifts in colour balance will colourise whites very obviously, and usually undesirably. Having completed our Color Balance adjustments, we've used the Levels feature to reveal more detail in the shadow background by adjusting the midtone slider. See the next chapter for more information on using Levels.

# Mixing colour channels

Use this method to generate tonally-superior greyscale images from colour shots

**W**hen you create a greyscale image from a colour photo by desaturating the colours, Photoshop produces a black-and-white version which has been generated from the pixel values in all channels equally. To control this conversion more precisely, use the Channel Mixer instead. Although you can use the Channel Mixer to create haywire colour effects, and even to remove colour casts with a great deal of trial and error, the feature is actually intended as a means of desaturating a colour image

in a controlled fashion. Instead of accepting the default conversion of colour pixels to neutral grey pixels across all channels in an RGB or CMYK image, you get to choose which channel's pixels are emphasised over the others. For example, you could use Channel Mixer to increase the bias in the Blue (or Cyan) channel in an outdoor photo to ensure the monotone result contains plenty of cloud contrast in the sky. You can even choose one channel only to produce the monochrome version.



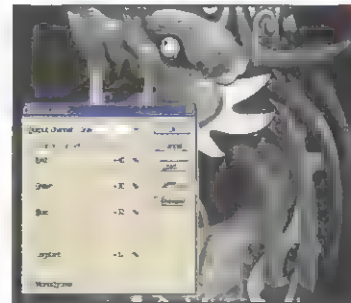
## Finishing touches

Having generated a high-quality black-and-white digital photo from a colour original, it can often be perfected with a hint of colourisation. The best way to do this is to use the Color Balance command, applying a slight shift of the sliders away from neutral in order to produce a visually-pleasing alternative to plain greyscale, and a tonally-superior alternative to Duotones (see page 25).

## GUIDE TO THE CHANNEL MIXER

### Get the best out of the Channel Mixer with our advanced tips

Open the Channel Mixer from the Image > Adjustments menu. Tick the Monochrome option at the bottom of the Channel Mixer dialog window so that you can preview the effect you're generating. If you want to base the greyscale on a particular channel before fine-tuning, choose the channel in the Output Channel drop-down list before ticking the Monochrome option. All this does, however, is set the channel to 100%. Dragging on the sliders lets you create a custom greyscale, applying different percentages from each channel. For the best results try to ensure that the total percentage value of all three (or four for CMYK) channels is roughly 100.



Use channel sliders to customise the greyscale, then the Constant slider to adjust the pixels' overall brightness

# Hue, saturation and brightness

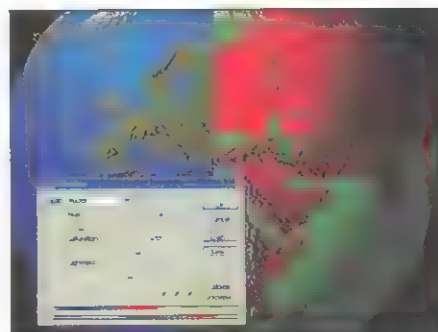
Take control over the HSB values in an image to create both subtle and startling results



## Tonal greyscale

Add a Hue/Saturation adjustment layer to a colour image and reduce the Saturation slider to 0 to make it monochrome. Select the Background layer again and add another Hue/Saturation adjustment layer. Change this last layer's transparency blending mode to Color. Double-click on the adjustment layer to reopen the Hue/Saturation window and drag on the Hue slider to adjust tonal values interactively.

In Chapters 1 and 2 you learned about HSB as a system of colour perception. As well as letting you create fixed colours with HSB values, Photoshop also makes it possible to adjust the colours in an image using HSB principles. The Hue/Saturation window enables you to do three things individually or in combination: remap colours to other colours by twisting the virtual colour wheel, make colours more intense or greyer, and adjust the lightness throughout the image. It's useful for correcting photos with incorrect



Adjusting the Hue and Saturation sliders alone can produce colour negative effects and highly-complex, psychedelic shifts in colour

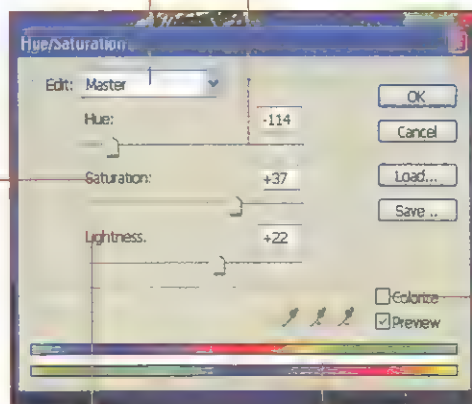
colour and tonal values, and even more so when applied to specific colour areas, as shown opposite.

## HUE/SATURATION BASICS

Choose a key colour area (such as reds or yellows) from this drop-down list within which to focus your hue shifts in the slider below.

Drag on the Saturation slider to increase or decrease the intensity of the colours according to standard percentages, -100 to +100.

The Lightness slider adjusts the lightness of all colours throughout the image between -100 to the left (black) and +100 to the right (white).



The Hue slider remaps the colours of all the pixels in an image to others, using colour wheel degree increments from -180 to +180.

Tick the Colorize option to produce a monochrome version of the image, using the Hue slider to apply an overall colour tint.

These two bars represent the spectrum in the colour wheel. As you adjust the Hue slider, the two bars shift out of sync.

# Advanced Hue/Saturation

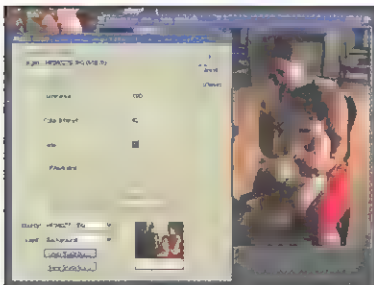
Put the Hue/Saturation command to practical use to recolour a photo with expert precision



**1** In this example we have a stock library photo of a forest in autumn, but we want the trees to appear as they would in the summer. So let's use Hue/Saturation to turn the yellowing leaves a rejuvenated green. Begin by opening the Hue/Saturation window and selecting Yellows from the Edit drop-down menu. The trees aren't all yellow, but you need to select a colour to get started.



**2** Having selected a colour, the Eyedropper buttons just above the two spectrum bars become active. Click on the plain Eyedropper and click an area of the image which contains mostly yellow leaves. This fine-tunes the initial Yellows choice by picking up more precisely the yellow-orange tones that we want to adjust.



**3** Now click on the Add To Sample tool, which is the Eyedropper with a + symbol. Remember, you're selecting tools within the Hue/Saturation window, not from the main Tools palette. Use this tool to expand the colour selection, perhaps including paler leaves or redder leaves. If you think you've added too much, use the Subtract From Sample tool (the Eyedropper with a - symbol).



**4** You can now drag on the Hue slider to shift the selected colours to another range in the colour wheel. In this instance, we've dragged the slider until the yellow leaves in the trees have turned a bright, chlorophyllous green without affecting the branches, sky or anything else. To tone-down the glowing green we selected initially, we've also dragged the Saturation slider to the left.



**More fine-tuning**  
When you select a colour, the colour area is marked in the colour bars at the bottom of the Hue/Saturation window. The two inner vertical marks represent the selected colour area. The space between these and the two outer triangular marks indicate the gradual 'drop-off', or measure of tolerance around the selected colour. You can drag on these marks to redesignate the colour selections directly.



**Unwanted colour shift**  
Keep a sharp eye on how hues are changed throughout an image. Changing someone's shirt from pink to blue, for example, may have an unwanted effect on skin tones, as well as the shirt. A knock-on effect like this will be ignored in a photo of trees, but is more obvious with photos of people. In these instances, we suggest using the Color Replacement Tool instead (see page 69).



# Selective colour changes

Use this technique to effect colour changes in harmony with process colour output



## Method madness

You can choose between two Method options at the bottom of the Selective Color window. The Absolute method lets you set absolute values for the CMYK colours; for example, if you add 10% to 50%, the resulting colour will be 60%. The Relative method applies your percentage to the initial value, so in this instance adding 10% would actually be an increase of 10% of 50%, that is 5%.

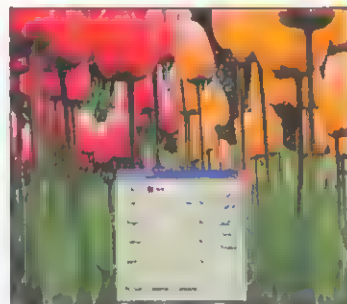
We've already touched on the issue of colour gamut with regard to CMYK process printing. You can set Photoshop to show you out-of-gamut pixels in a RGB or LAB mode image – that is, colours that can't be reproduced accurately in print – by choosing the Gamut Warning command under the View menu. In the past, high-end scanner operators were able to adjust such out-of-gamut pixels from digital scans by applying a selective colour shift to affected primaries, literally altering them to real-world CMYK

values. These days, you can do it yourself with the Selective Color command. The image you're editing doesn't need to be converted to CMYK first, but the controls themselves are CMYK-specific. You can use this feature to ensure glowing on-screen colours are reproduced in print according to an acceptable, predictable compromise rather than trusting to luck. For example, use Selective Color to shift royal blues to prevent them turning purple when printed. You can even make more radical changes, as explained below.

## PRIMARY COLOUR SWITCH

Selective Color can conduct major shifts as well as subtle ones

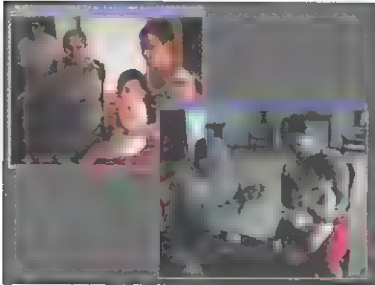
Try the following as an alternative to Hue/Saturation when you want to change an isolated colour in an image which is a primary. Open the Selective Color window from the Image > Adjustments menu, then from the Colors drop-down menu, pick a primary colour that corresponds to the one you wish to change. The Cyan, Magenta, Yellow and Black sliders can now be manipulated to bring about a colour shift in the primary colour. You're effectively increasing and decreasing the CMYK components within the selected colour. So for example, if you choose Greens, dragging the yellow slider to the left would leave green areas looking blue.



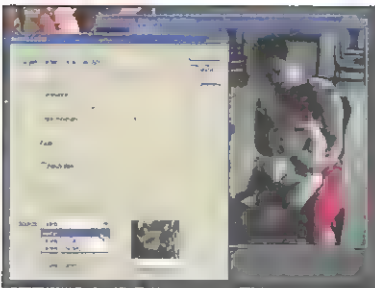
The right half of this photo has been adjusted to reduce magenta in the Reds, leaving the flowers yellow

# Match colour between shots

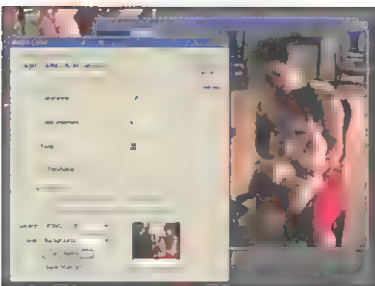
If a sequence of photos look inconsistent, take colours from one shot to apply to the rest



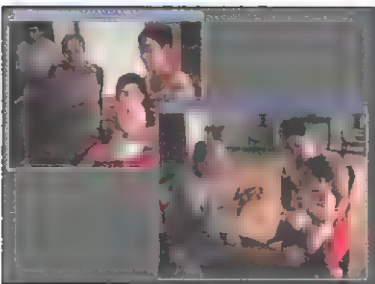
**1** Begin with two or more photos which were taken at the same time. You can see here that our digital camera had been left on automatic exposure mode, and adjusted itself unexpectedly for the second shot. Since these two photos were taken of the same subjects within a few seconds of each other, we want them to look similar in colour.



**2** Your currently-selected image should be the one you want to adjust – your ‘destination’. The other image should be the ‘source’. Open the Match Color window from the Image > Adjustments menu (Photoshop CS only). From the Source menu, look for the filename of your source image and select it. Photoshop remaps the destination image to use those colours from the source image.



**3** Only rarely will the initial adjustment be perfect. In our case, it caused the image to appear too warm, to the extent of looking almost sepia. To compensate for this, we reduced the Color Intensity slider slightly and dragged the Fade slider a little way towards the right. The Fade slider works like a gradual Undo command.



**4** Try to keep both the source and destination photos visible together on-screen to help you judge the colour match by eye, then click OK when you're happy. If you have a large number of similar shots to deal with, consider using the Save Statistics and Load Statistics buttons to save your settings, so you can apply them to other images later on.



## Layered matches

This tutorial explains how to match colours across simple photos. You can also use the feature to match colours from any single layer in the same image, or from a specified layer in another image. This means you can maintain consistency even between complex, multi-layered artwork.



## Indexed limitation

Like Selective Color and Channel Mixer, the Match Color command does not work with Indexed Color images. You may think that a way around this is to save the colour table from one indexed colour image and then load it up to another. Unfortunately, Photoshop doesn't know automatically which colour in the table applies to which pixel in the destination image, so unless you encounter extraordinary luck, the result will be a mess.

# ADVANCED EDITING AND SELECTION

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This chapter focuses on more advanced methods of selecting and editing colours in an image. From Levels and Curves to colour replacement, all you need to know is here

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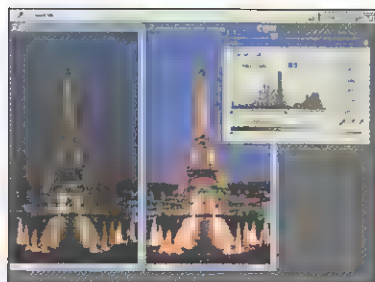
**W**ith some fundamental concepts under your belt anyone can become a Photoshop expert. So far you've learned to analyse and handle colours using a variety of slider controls and options. From now on, you'll be tackling colour more directly, using powerful tools and functions which need a little more explanation.

## **Levels and Curves**

The first half of this chapter is devoted to Levels and Curves, the dual foundations on which professional image enhancement stand. So important have these two features become that many other

photo editing programs now present them under similar guises. The principle behind Levels and Curves is generally the same across all these programs, so what goes for Photoshop will also apply to Paint Shop Pro among others. There aren't enough pages here to cover absolutely everything you can do with Levels and Curves, but we've included practical tutorials for solving real-world image correction problems. These will get you started, and help you to understand how these advanced features work.

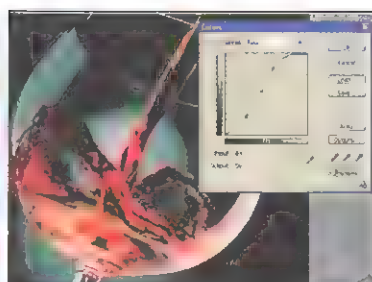
Although offered as a quick-fix solution for badly-exposed photos, the Shadow/Highlight command in



**Page 58** Learn to edit colours and tonal range using the Levels command



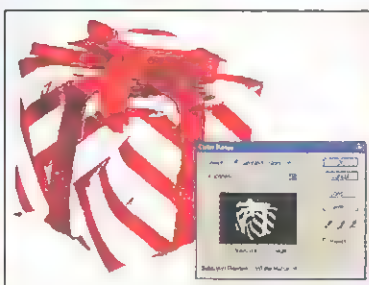
**Page 60** Go further with Levels using the Levels Eyedroppers



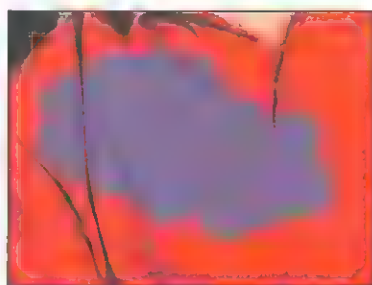
**Page 61** Master the powerful but easy-to-grasp Curves adjustment feature



**Page 62** Learn how different Curve shapes affect colours and contrast



**Page 67** Select areas for editing the expert way with the Color Range function



**Page 69** Paint one colour directly over another with the Color Replacement tool

Photoshop CS is worth investigating for its ability to make powerful adjustments to images in which detail has been hidden in shadows and highlights. We show you two techniques using this command, one being a contrast-enhancement alternative to manipulating Curves or tweaking Levels when you don't have time to experiment.

## Colour selection

The final pages of this chapter explain four methods of selecting and changing particular colours in an image directly. Beginning with the good old Magic Wand tool, you'll quickly move on to the

powerful Color Range command and the highly-useful and effective Replace Color dialog. You'll even find out how to paint a new colour directly over an old one in a photo in such a way that no-one will be able to guess that the new colour isn't the original. This will wrap up our look at dealing with colour on an everyday basis, before we move on to learn about special effects and colour management. Put together, the techniques covered in Chapters 4 and 5 will turn your computer into an image processing powerhouse; no colour correction, enhancement or editing operation will be beyond your abilities!



# Master the Levels command

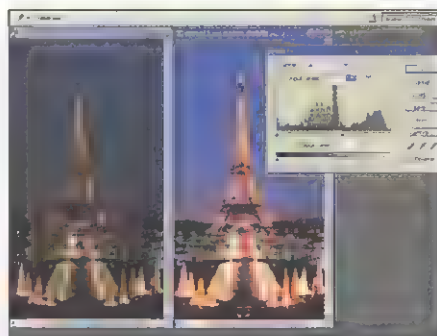
This is one of the key features for enhancing the tonal range and colour balance of an image



## Output Levels

The Output Levels bar appears to work like a contrast adjustment, but in fact it's used for preparing images for dot gain on a printing press. By constraining the pixel data within a narrower range, you can maintain better reproduction than if you leave delicate image detail in the extreme shadows and highlights which may not be printable on the final press.

Once you understand the rough principle behind histograms you're ready to tackle Levels. Along with Curves, Levels is one of the most important and versatile image adjustment features in Photoshop – and is also less complicated than it looks. Using the histogram as a guide, you can tuck the shadow and highlight points tight around the image data and adjust the midtones independently. Alternatively, you can use a set of Eyedroppers to configure these points inside the image itself. Adjustments can be



Once you get the hang of the Levels command, this kind of precise image enhancement only takes a few seconds to perform properly

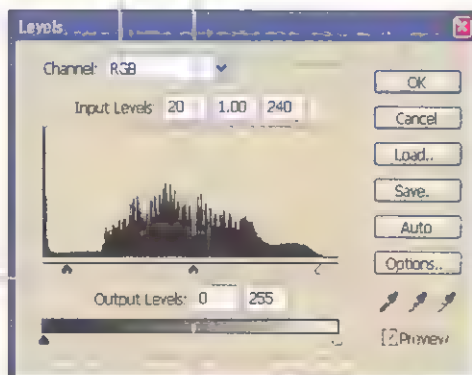
made to the composite image or to individual channels, depending upon exactly what is required.

## THOSE TOOLS IN FULL

Choose whether to adjust settings for the composite image in RGB (including Indexed Color), CMYK or LAB mode, or for individual component channels.

Drag on the shadow, midtone and highlight sliders to set their respective points. Their values are given in the Input Levels fields above.

The Output Levels bar enables you to set the shadow and highlight levels so they compress the image into a narrower tonal range.



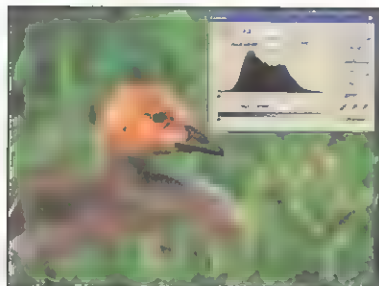
This histogram is essentially identical to the one shown in the Histogram palette (see page 42), except that you can edit it.

Click on Auto for a quick-fix stab at image correction (see page 46) and customise the Auto Options (see page 47).

Use these Eyedropper tools to set shadow, midtone and highlight points visually by clicking in the live image window itself.

# Edit Levels by channel

Make simultaneous tone and colour corrections to an image by editing individual channels



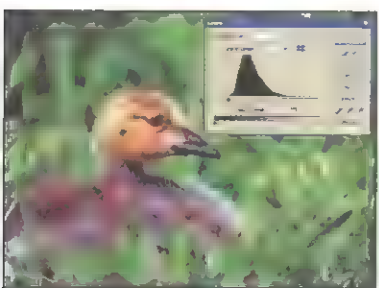
Let's say you have a photo which appears a little too warm. For example, the grass in this photo is yellowy, bordering on the orange, while the chick really ought to be a greyish colour. Open the Levels window from the Image > Adjustments menu, or use the easy-to-remember keyboard shortcut [Ctrl]+[L] ([Command]+[L] on a Mac).



Use the Channel drop-down menu to look at the histograms for the individual channels to see where there's too much spill. You can toggle between the channels quickly using keyboard shortcuts; hold down [Ctrl] ([Command] on a Mac) and type 1, 2 or 3 for red, green or blue respectively in an RGB image or 1, 2, 3 or 4 for CMYK. [Ctrl/Command]+[~] returns to the composite channels.



In our example photo, we found the problem in the green channel. There are big gaps on either side of the histogram, indicating that more green is being applied than is necessary for that channel's actual image data. So we've nudged the shadow and highlight sliders inwards to where the histogram begins to rise.



A similar adjustment is also made to the blue channel, manually moving those sliders inwards so that the extraneous areas beyond either side of the actual pixel data in the histogram are shut out. The grass in the photo is now greener, and the chick is a more realistic colour too, while overall contrast in the image has been improved dramatically.



## Contrast sharpen

Carefully editing the shadow, midtone and highlight sliders for each channel one-by-one has the effect of improving contrast in a measured, appropriate fashion. This in turn enhances clarity in image detail. Consider using Levels as an alternative to the Sharpen commands under the Filter menu.



## Threshold mode

Hold down the [Alt] key ([Option] on a Mac) and drag the shadow or highlight slider left and right. Photoshop goes into Threshold mode, presenting a live, high-contrast preview of the image to help you more easily identify the lightest and darkest areas in conjunction with the histogram. This trick only works for RGB images.

# The Levels Eyedroppers

Use these tools to locate and reset shadow, midtone and highlight points in an image



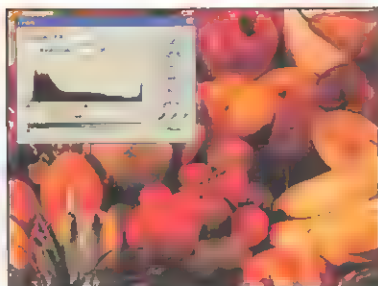
## Color Picker

Double-clicking on any of the three Eyedroppers in the Levels window opens the Color Picker. This enables you to set the shadow, midtone and highlight points as manually-specified colours instead of clicking on the image itself. Doing so may be helpful if you can't identify the appropriate area in the image but know the general colour of the caste you want to remove.



## Active tools

While the Levels window is open, Photoshop's menus are greyed out and the main Tools palette is unresponsive. But you can still access a number of different tools using keyboard shortcuts. By default, the cursor becomes the Eyedropper when passed over the image window. Hold down the Spacebar to toggle on the Hand Tool for scrolling. Hold down [Ctrl]+[Spacebar] ([Command]+[Spacebar] on a Mac) to zoom in, or [Alt]+[Spacebar] ([Option]+[Spacebar] on a Mac) to zoom out.



This sample photo of fruit suffers from a very serious caste. You could spend a long time trying to correct this with the Color Balance (see page 50) or similar commands, and the Auto correction commands (see page 46) won't work. Call up the Levels window and you can see that the histogram stretches right across the available space, so at least there's plenty of colour data to play with.

Click on the Set Black Point Eyedropper in the Levels window to activate it. Now locate a shadow area in the image which you know ought to be black, then click on it with the Eyedropper. Unless your image is particularly poor in contrast, you may not notice a big change just yet.

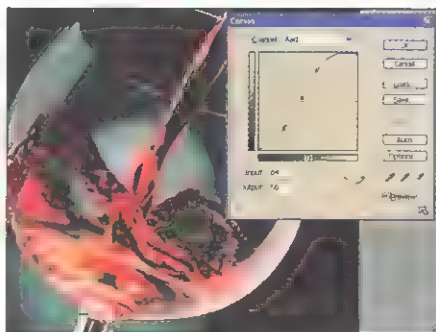
Click on the Set White Point Eyedropper to activate it, and click on an area in the image which you know ought to be white. This may be tricky if the image is dark, or suffers from a heavy caste, so try the Threshold mode tip explained on page 59, and zoom in to locate small patches of reflective highlights.

Finally, click on the Set Gray Point Eyedropper and click on an area in the image you know ought to be a neutral grey. The transformation in the image colour can be dramatic, depending on how well you chose your neutral grey pixels. If you make a mistake, hold down the [Alt] key ([Option] on a Mac) to turn the Levels window Cancel button into a Reset button, and click on it to start again.

# Adjustment with Curves

Improve your mastery over tonal adjustment further with the advanced concept of Curves

Photoshop's Curves window looks different from the Levels window, but the two features are similar in their effect. The main difference is that while Levels lets you set the black, white and midtone points, Curves makes it possible to set a variety of different midtone points across the whole tonal range, rather than just one in the middle. This is represented as a line chart instead of a histogram this time, showing how original (input) values are adjusted or remapped to new (output) values. The original values



*Enhancing the red channel with a classic S-curve boosts the contrast and enriches the redness of the wine's colour in this photo*

are shown across the X axis at the bottom, while the new values are displayed on the Y axis to the left.



## Point break

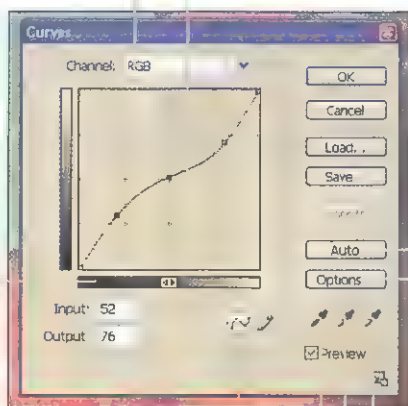
Most of the time you'll plot or draw quite simple, smooth curves. But for those occasions when only the finest of tuning will do, Photoshop allows you to plot up to 14 different points on the curve in addition to the extreme white and black points. This way you can produce highly-specialised results with variable handling throughout the entire tonal range.

## AROUND THE CURVES WINDOW

As with the Levels dialog window, you can choose to edit the image as a composite or work on individual channel colours selected here.

By default, the chart values are measured in increments between 0 and 255. Click here to switch to percentages instead.

You can plot a curve by adding points, or use the Pencil mode to draw the curve freely by hand.



The ends of the curve represent highlight and shadow, while the curve itself represents all the midtones between the two.

The Auto button conducts an instant adjustment (see page 46), and you can customise this action in the Options dialog (see page 47).

These Eyedroppers let you set black, midtone and white points by clicking on different areas in the image window itself.



# Curve editing in action

Here's a demonstration of how the shape of a curve affects the image you're working on



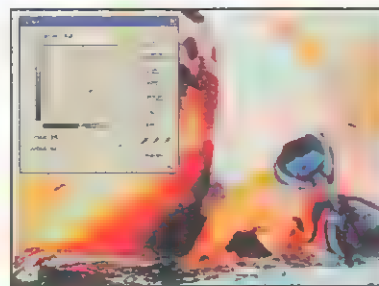
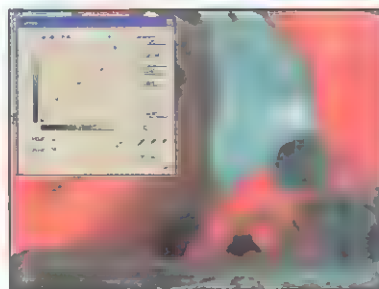
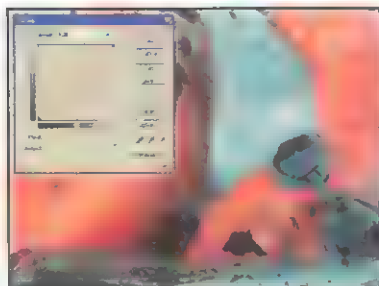
## Level indicator

While the Curves window is open, click and drag across your image window. The intensity values under the cursor are displayed as an animated circle moving up and down the curve line. This will help you to identify the white and black points. If you're viewing individual channels in a CMYK image, the Curves window also shows percentage values as you drag the mouse over the image.



## Add points

Having employed the tip above to locate the black and white points in an image and view their position along the curve line, it's a bit fussy to have to click at that location in the curve to add an edit point. Instead, just [Ctrl]+click ([Command]+click on a Mac) in the image window. This automatically adds an edit point to the curve at the precise location.



Open any photo – it doesn't need to be one that requires correction. Call up the Curves window from the Image > Adjustments menu or use the keyboard shortcut [Ctrl]+[M] ([Command]+[M] on a Mac). Initially, an unedited curve is a perfect diagonal, showing that the input and output values across the two axes are identical to start with.

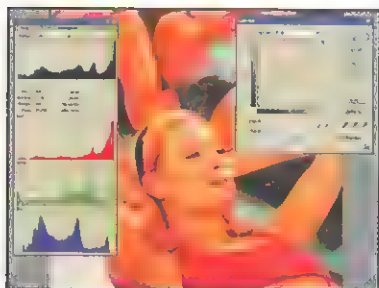
Add three edit points to the curve by clicking on it at three different positions. Position one point at the dead centre of the chart, then add the other two on either side of it. Drag the upper-right point downwards a little and the lower-left point upwards as shown. Note how this has the effect of flattening colours and reducing contrast.

Drag the upper-right point upwards and the lower-left point downwards. This has the opposite effect, intensifying colours and strengthening contrast. This gentle S-curve shape is a common method of enhancing photos in one step without having to fiddle with other adjustment controls. Remember to keep the curve shape gentle, or the image quality will quickly deteriorate.

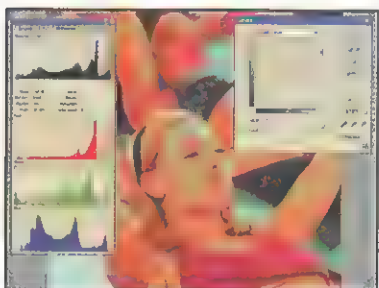
For more experimental enhancement, try switching to the Pencil tool in the Curves window and sketching the curve shape by hand. You'll find that different shapes produce radically-different visual effects, some striking, others ghastly. To view and edit individual points on the curve after drawing the line, switch back to the point editing tool.

# Channel correction with Curves

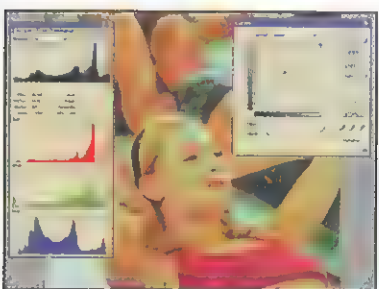
Analyse and edit individual channels to shift the colour bias and remove unwanted castes



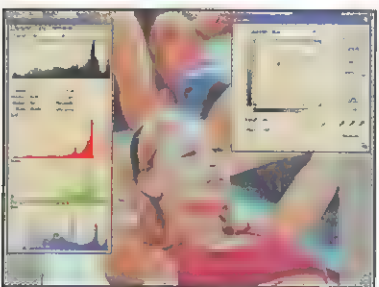
1 Open a photo in which the colours don't seem quite right. If you have Photoshop CS, you may wish to open the Histogram palette too, as you'll find it very helpful when editing individual channel curves. For example, the Histograms here tell us that while the green and blue channels are reasonably well balanced, the red channel data is bunched up towards the highlights on the right.



2 Select Red from the Channel menu in the Curves window. We want to tone down the red data from the highlights. To do this, we just clicked the highlight point on the curve – the top-right point – and dragged it downwards a little. If you have the Histogram palette open, you'll be able to see the effect of shifting the image data across the chart.



3 The image looks a bit dark, and we want to compensate further for the red highlights. We can do both in an RGB image by boosting the other two channels. Here we've selected Green from the Channel menu, clicked dead-centre on the curve and dragged it a tiny bit upwards towards the top-left corner.



4 To finish off and eradicate the green tinge, view the blue channel and repeat the previous step. We've boosted the central midtone a little more for blue than we did for green in order to achieve a more acceptable skintone, not just for the model in the foreground, but the figure behind her too.



## Re-use curves

When you have a series of similar images to correct, such as a full photo-shoot, you should consider adjusting the first image with Curves and re-using those settings for the other photos. You can do this by clicking on the Save button in the Curves window then, for each subsequent shot, click Load and open up the saved settings.



## Component edit points

Hold down the [Ctrl] and [Shift] keys (on the Mac, the [Command] and [Shift] keys) and click in the main image window to add edit points to the curve. Unlike the tip on the page opposite, this adds the edit points to the individual component channel curves at their relative positions.

# Salvaging exposure errors

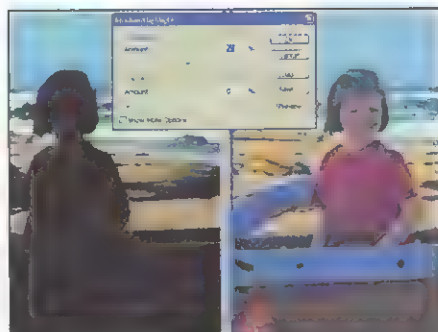
The Shadow/Highlight adjustment feature in Photoshop CS can rescue 'hopeless' images



## Tonal Width

The Tonal Width setting for revealing image detail hidden in shadows is set to 50% by default. If this causes midtones and highlights to change too much, drag the slider to the left. But if the midtones look dark, drag the slider towards the right. Remember, Tonal Width is not the amount of correction, but the size of the tonal range to which the correction is applied.

Readers running Photoshop CS have an excellent feature they can call on: Shadow/Highlight, under the Image > Adjustments menu. It provides a set of slider controls for revealing detail hidden in shadows or highlights without affecting the rest of the image. It's ideal for salvaging photo exposure errors, the most common example being a shot of someone in shade with a bright background behind. The clever part about Shadow/Highlight is that it analyses image pixels to determine the shadow and highlight areas, and



The results will not be perfect, but as a salvage operation for ruined shots this is a quick-fix solution that works every time

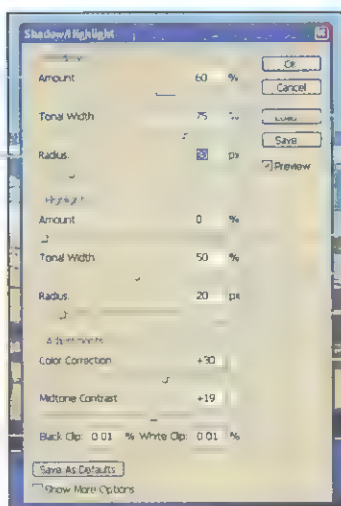
adjusts them in isolation. It's not necessary to work with the selection tools to identify areas to be adjusted.

## SHADOW/HIGHLIGHT CONTROLS

Drag on this slider to adjust the amount of correction applied to the image. Increasing the value reveals more detail in the shadow areas.

The Radius slider controls the size of the area around each pixel that's used to determine whether that pixel is in a shadow.

The Black and White Clip values are used for specifying the extreme shadow and highlight points, but only need changing for very poor quality photos.



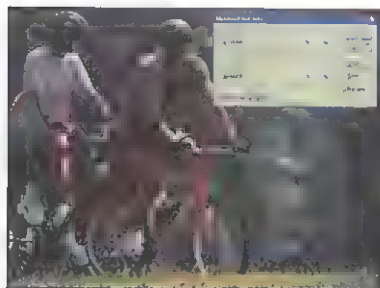
Tonal Width here controls the range of tones in the shadows that will be modified by the other settings in this dialog window.

These three sliders perform exactly the same job as the three above, but for highlights rather than shadows.

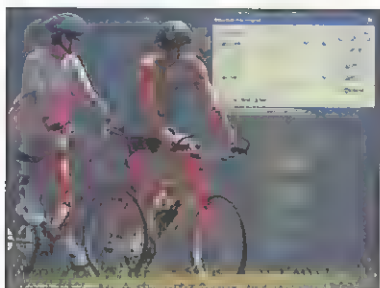
Color Correction allows you to increase the saturation of the pixels that have changed. Midtone Contrast compensates for any contrast-flattening side effects.

# Shadow/Highlight in practice

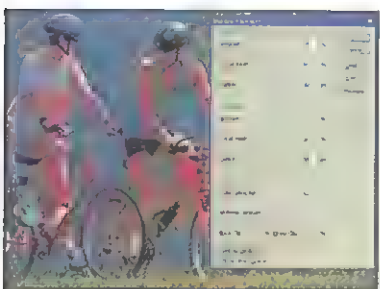
This Photoshop CS feature isn't restricted to correcting foreground exposure problems...



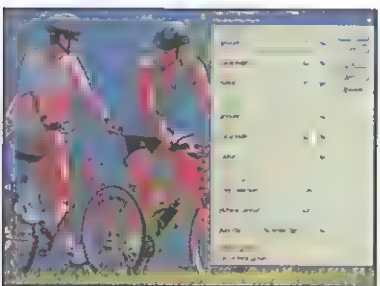
Open an image which has some undesirable dark areas, but would suffer from conventional correction because it also contains brilliant highlights. Call up the Shadow/Highlight window from the Image > Adjustments menu. Here you can see the original photo prior to adjustment if you un-tick the Preview option in the window.



Now tick the option back on to show the corrected version of the image according to Photoshop's default settings. It's a fairly decent start, but the photo will definitely benefit from some fine-tuning. Part of the challenge is to reveal the dark faces of the two bike riders without making the entire background (also in shadow) too pale as well.



We've revealed more detail by dragging the Amount slider from 50% to 70%, and have expanded the Tonal Width to 60%. Note that the Highlights sliders have been left alone; the highlights in this image are fine the way they are, and only the shadows need correction. While the background has become paler, the two bikers stand out much better than they did before.



Optionally, add some zing to the colours you've revealed by dragging the Color Correction and Midtone Contrast sliders towards the right. Be careful, though, as too much saturation can make a photo appear unrealistic; you want just enough to give the impression of bright sunshine. Now the pale background isn't a problem anymore, since the foreground is so punchy.



## Curves of course

The advantage of Shadow/Highlight is that the adjustment is virtually automatic and easy to tweak. You can, however, achieve the same result with Curves. Our sample shot on this page, for example, could be fixed by dragging the white point of the curve towards the left and adding a midtone point, which is then dragged slightly towards the top-left corner.



## Keep expectations low

The problem with revealing image detail hidden in shadows is that this detail is often of poor quality. In most cases, these areas suffer from grainy speckling and colour noise that's difficult to keep at bay; the more you reveal, the worse the quality seems. Either stick to moderate adjustment, or accept the fact that a problem image can never be made to look absolutely perfect.



# Magic Wand selection tool

Don't forget you have a selection tool designed specifically to pick out colours for editing



## Add and subtract

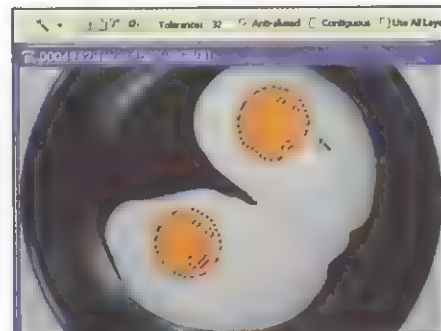
Toggle between Magic Wand selection modes using keyboard shortcuts. Hold down the [Shift] key to add to the current selection with each click of the Magic Wand. Hold down the [Alt] key ([Option] on a Mac) to subtract from the current selection. Hold [Alt]+[Shift] ([Option]+[Shift]) to choose an intersection area between the pixels you currently have selected and those you're about to select with the next click.



## Easy expansion

To expand the area selected by the Magic Wand there's no need to alter the Tolerance value and start again. Instead, use the Grow command to let the selected area spread out, or use the Similar command to select other matching pixels in the image non-contiguously. Both commands are found under the Select menu and the Magic Wand's own context menu.

The previous chapter touched on changing colours selectively, by channel or by hue. For more precise editing, you may find it useful to pick out objects in your image by colour and edit them directly. The tool for this job is the Magic Wand. Click in your image with the Magic Wand to select the pixel directly under the cursor along with similarly-coloured pixels around it. Although the tool is sometimes derided for its imprecise selections, an imprecise selection can still be helpful when making colour adjustments without affecting



Select both egg yolks for colour editing with one click using the Magic Wand in non-contiguous, anti-aliased mode

the entire image. When you're editing photos, remember to always keep the Anti-aliased option ticked.

## OPTIONS BAR SETTINGS

**TOLERANCE VALUES** refer to the similarity in pixel colours that will be selected compared to the actual pixel you click on. Enter a value between 0 and 255; larger values mean broader ranges of colour will be selected.

**ANTI-ALIASED SELECTIONS** have a soft, slightly 'feathered' edge. Ticking this option ensures that any changes made to the selected area will not have a hard, jagged edge which would look unrealistic in photos.

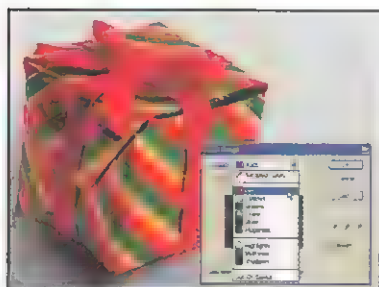
**CONTIGUOUS SELECTIONS** are those within one continuous, unbroken area. If you remove the tick from here, all pixels throughout the image which share the same colour as the one you clicked on will be highlighted.

**LAYERED IMAGES** can work with the Magic Wand by layer, or across all the layers.

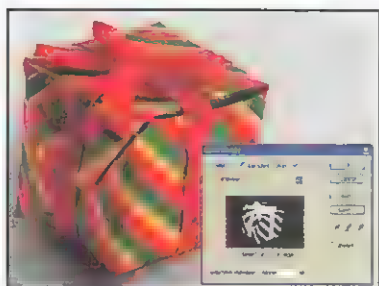
**ADD, SUBTRACT AND INTERSECT** Magic Wand selections using the buttons at the top-left of the Options bar.

# The Color Range command

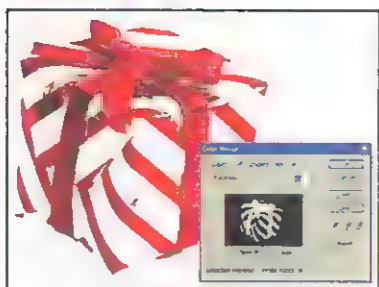
Choose a colour or range of colours from a dialog window and convert them to a selection



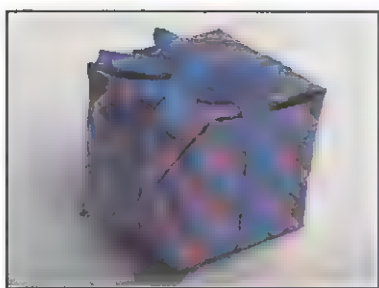
With an image open, select the Color Range command under Photoshop's Select menu. If the colour you want to select is a simple primary, choose it from the Select drop-down menu at the top of the Color Range dialog window. If the Selection preview pane below shows only a ghostly outline of that colour found in the image, try the Eyedroppers, as explained in the next step.



Click on the plain Eyedropper tool in the Color Range window to activate it. Then, in the main image window, click on the coloured area you want to select. Use the Add To Selection Eyedropper to select similar colours across a wider area. The [Shift] and [Alt] ([Option] on the Mac) keys toggle the Eyedropper to Add To or Subtract From Selection modes respectively.



The preview pane gives you a basic idea of how well your selection is building up. For a more accurate preview, choose one of the options from the Selection Preview drop-down menu at the bottom of the Color Range window. Here we've chosen White Matte, showing the selected areas on a pure white background. This makes stray selections easy to spot and remove.



When you click OK, the coloured areas selected in the Color Range window become active selections in your image window, ready for editing. Here we've used Color Range progressively to select the ribbon and wrapping paper colours one by one and change them to new colours using the Hue/Saturation command (see page 52).



## Preview toggle

Instead of clicking on the Selection and Image mode options under the preview pane in the Color Range window to switch from one mode to the other, you can toggle instantly between the two modes by holding down the [Ctrl] key ([Command] on a Mac).



## Preview target

Normally you pick colours with the Eyedropper tools by clicking in the main image window. However, you also have the option of clicking directly within the preview pane of the Color Range window. This may be helpful if you're working on very large images and you don't wish to zoom out or scroll around the main image window to hunt for areas to click on.

# The Replace Color feature

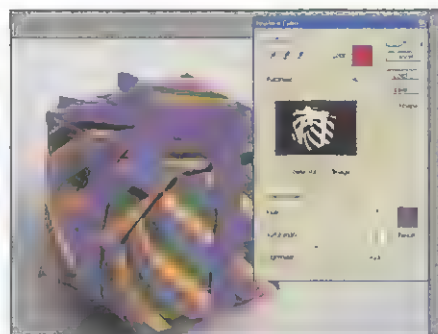
Create a mask on the fly to select a coloured area and instantly replace it with a new colour



## Temporary mask

The effectiveness of the Replace Color command relies on the new colour being applied through a greyscale mask, rather than selected areas simply being filled with a solid replacement. However, this mask is generated and disposed of on the fly. As soon as you click OK or Cancel in the Replace Color window, any mask created is lost immediately.

Many colour selection tasks are carried out with the sole intention of changing that colour to another one. To this end, Photoshop comes with a Replace Color feature, which can be called up from the Image > Adjustments menu. Similar in many ways to the appearance of the Color Range window, Replace Color lets you sample colours in an image using Eyedroppers; it then creates a mask and applies to it a replacement colour of your choice. Importantly, it handles all this as one task, even previewing the final result



The red ribbon and red stripe on this parcel have been selected and converted to purple in one fell swoop

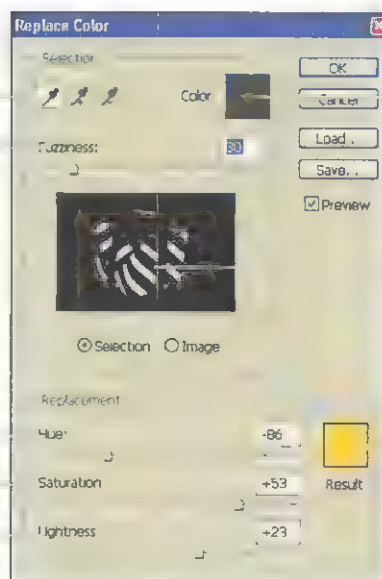
in the main image window. This saves you the trouble of having to use multiple tools and commands.

## REPLACE COLOR CONTROLS

Use these Eyedroppers to select colour areas by clicking in the main image window, or by clicking in the preview pane below.

Drag the Fuzziness slider to adjust the tolerance of the mask. The greater the value between 0 and 200, the greater the colour variance selected.

Choose a replacement colour using hue, saturation and lightness sliders (see page 52) and see the effect immediately in the image window.



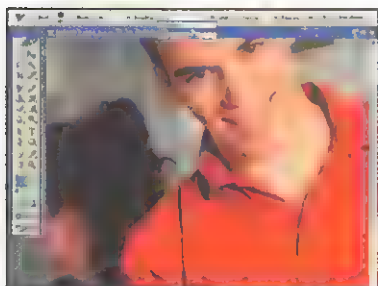
Click on this square colour swatch to call up Photoshop's Color Picker dialog window if you wish to specify the colour to be selected precisely.

The preview pane shows the mask as white on a black background, or choose the Image option underneath to view the image thumbnail instead.

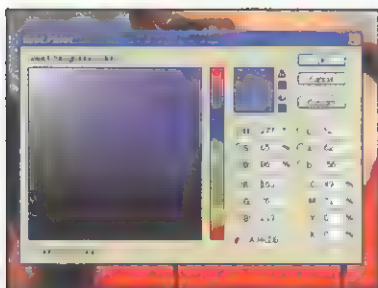
If you don't want to use the HSB sliders, click here to call up the standard Photoshop Color Picker and use your preferred method.

# Painting replacement colours

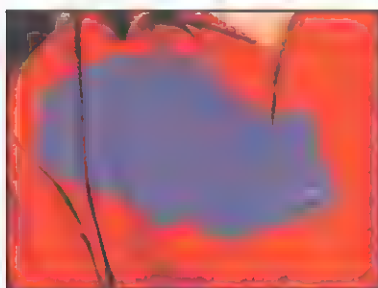
For the ultimate hands-on colour change, apply the Color Replacement tool like a paintbrush



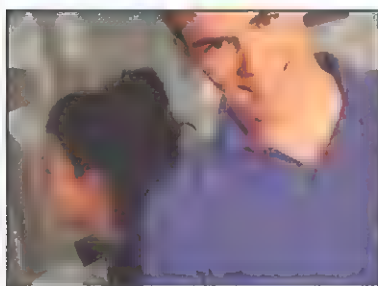
**1** Open an image and click on the Color Replacement Tool in the Tools palette to activate it. If you can't see it straight away, you'll find it in the fly-out menu along with the Healing Brush and the Patch tools. For this exercise we'll be recolouring someone's shirt. In the Options bar, set the Mode to Color, Sampling to Once and Limits to Contiguous.



**2** Click once on the Foreground colour square in the Tools palette to call up Photoshop's Color Picker window. Mix or choose a colour and click OK. This new Foreground colour will be used as the digital paint for the Color Replacement Tool. In other words, it's the colour that will replace whatever you start painting over.



**3** Click and drag over an area in your image. Here we've begun overpainting the subject's red shirt with a purple Foreground colour. Note that the Color blending mode chosen in the Options bar allows the tonal texture to show through, producing a realistic result. With Sampling set to Once, we can drag the brush right to the edge of the red shirt without fear of the purple paint spilling over.



**4** Some care is still required, of course. In the case of the red shirt here, a little redness is reflected off the subject's skin, and there's a risk that this could pick up some of the purple too. There may even be red areas in the background to avoid. Minimise this problem simply by being careful with your brushstrokes at the edges. The recoloured result is surprisingly effective.



## Red-eye fix

One of the most popular uses of the Color Replacement tool is correcting red-eye from flash photography – the eye symbol within its tool icon in the Tools palette is a bit of a giveaway. When removing red-eye, keep the tool Mode as Color, set Sampling to Once and keep the Limits as Contiguous. Ticking the Anti-aliased option is also a good idea. All these settings are found in the Options bar.



## Brush limitations

The Color Replacement tool is designed to work with full-colour RGB, CMYK and LAB images in either 8-bit or 16-bit-per-channel mode. It can't, unfortunately, be used on images which are in Grayscale, Bitmap, Multichannel or Indexed Color modes.



## Chapter 6

# PRODUCING SPECIAL EFFECTS WITH COLOUR

### *In this chapter...*

- ☐ Create custom monochrome photos
- ☐ Invert colours and alpha channels
- ☐ Produce threshold and posterised effects
- ☐ Recolour images with gradient maps
- ☐ Apply Photo Filter tints
- ☐ Work with colour overlays

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Learn a variety of core colour treatment tasks and esoteric image manipulations in order to produce unique effects, and see how to combine certain effects across layers

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**H**aving worked through the many colour adjustment features of Photoshop, there are still a number of commands and effects which defy categorisation. For want of a better place, we've gathered them together here in one chapter under the general theme of 'special effects'. So far we've concentrated on understanding colour in the digital realm, using this knowledge to correct and enhance colour in images. Now it's time to start playing around with those features which sit on the outer borders of Photoshop's core set. Call them esoteric or call them silly, they all have practical uses if you know how

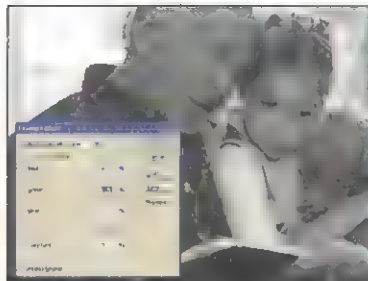
to approach them, and finding practical uses is all we care about.

### **Build a better greyscale**

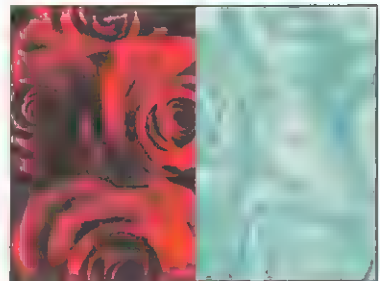
There's more than one way to skin a cat, and the opening pages of this chapter present a whole clutch of approaches for generating monochrome images from colour photos. Black and white photos are not just images in themselves, but are often the starting point for advanced recolouring work, so here you'll pick up a variety of new ways of creating them. Later on in the chapter, for example, we've included a professional's alternative to conventional duotones and tritones,



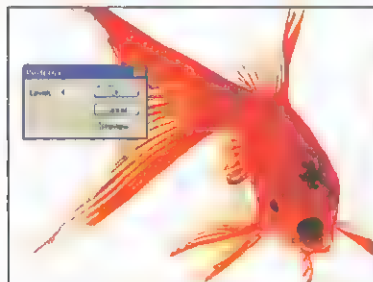
**Page 72** Discover several ways of using colour and greyscale in the same image



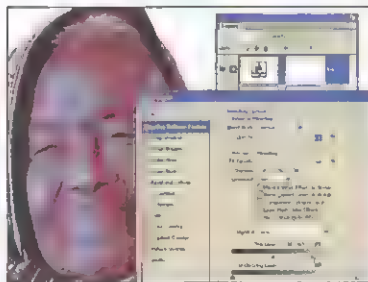
**Page 73** See how to desaturate colour without using the Desaturate command



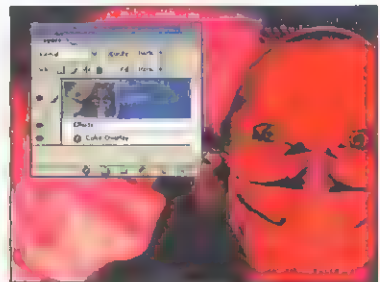
**Page 74** Find out the many different uses for the Invert colour feature



**Page 77** Convert images to simplified flat colours with the Posterize command



**Page 81** Create tritones which apply different colours to different tonal ranges



**Page 82** Access effects like Color Overlay and Gradient Overlay using Layer Styles

in which the tint colours actually vary from one to the other in harmony with the tonal range in the image itself. Success with this technique relies on starting out with a well-balanced monochrome photo.

## Colour psychedelia

As an antidote to grey, this chapter moves on to cover several colour treatment effects which simplify or complicate the colour content of your images. As ever, it's best to focus on useful applications so, for example, our treatment of the Invert command steers away from the creation of dreamlike negative inversions, instead offering a method

of using Invert for generating edge masks, which can in turn be used for precision sharpening.

## Photographic effects

Likewise, the final pages of this chapter associate features such as Gradient Map and Color Overlay with the reproduction of photographic effects. You'll learn how to invoke and customise them for whatever uses you want to make of them, but our specific tips are based around lens filter effects and lighting with gels. Also note that we'll be revisiting some of the weirder special effects in the creative colour project later on.

# Desaturate to grey

Convert a colour image to monochrome while retaining the ability to edit it in full colour mode



## Grey paint

*Here's another way to desaturate an image using brushstrokes. Activate the Sponge Tool – it's in the Dodge Tool fly-out in the Tools palette – and pick Desaturate from the Mode drop-down menu in the Options bar. Now you can desaturate as if with a paintbrush. For stronger desaturation, increase the Flow setting in the Options bar to 100%.*

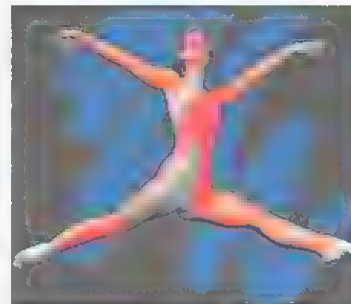
**B**ack on page 23 we suggested some alternatives to using the Grayscale image mode to convert colour photos to monochrome, and one of these was the Desaturate command. However, the ability to generate a custom black-and-white image from a colour original by desaturation has real advantages for the serious photographer beyond simply creating a Grayscale alternative. For a start, you lose less image information because you retain all your original channels, even in 16-bit mode. This means that

you can use a variety of techniques to tint the mono image, such as Hue/Saturation or Photo Filter (see page 80), and enhance tones with the reintroduction of subtle duotone-like effects with the Color Balance command (see page 81). It's also possible to mix mono and colour information on the same image, perhaps for selective tinting, or to mark annotations for training materials. The page opposite provides still more ways to generate monochromes without sacrificing your ability to add colour.

## MASK MIX EFFECT

### Paint colour back into a desaturated image by hand

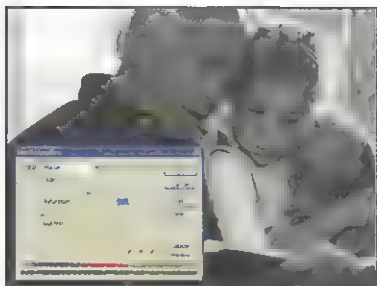
Here are two easy ways to create the effect of a monochrome image 'revealed' with colour brushstrokes. One is to click on the Quick Mask Mode button in the Tools palette and paint a mask with any brush tool. Click back on the Standard Mode button to convert the mask to a selection, then use the Desaturation command – voila! Alternatively, you can duplicate the Background layer and desaturate this new Background Copy layer. Click on the Add A Mask button and paint in this mask using any brush tool with a Foreground colour of black. Perhaps you can think up even more elaborate ways of achieving a similar effect.



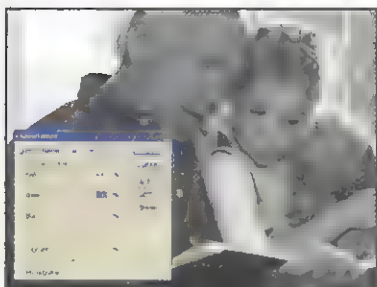
*This paintbrush effect can be created using layer masks, but here it's just a selection on a single-layer image*

# More desaturation methods

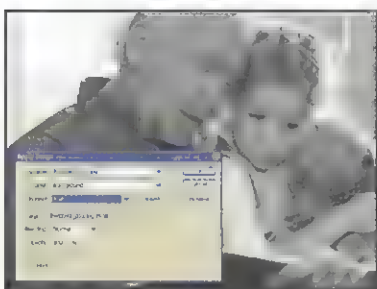
Create custom monochromes without using Grayscale mode or the Desaturate command



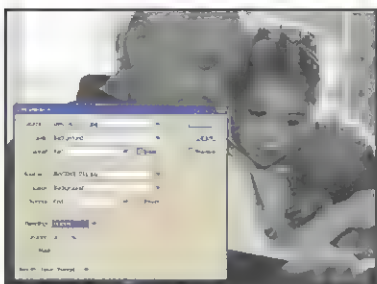
1 Open the Hue/Saturation window from the Image > Adjustments menu. With the Edit drop-down menu set to Master, click on the Saturation slider and drag it all the way to the left. You could also type -100 into the Saturation field and hit [Enter]. This has the same effect as the Desaturate command, removing colour information from the pixels but retaining your current colour mode.



2 Open the Channel Mixer window from the Image > Adjustments menu. Tick the Monochrome option at the bottom of the window to produce an instant desaturation. Adjust the Red, Green and Blue sliders to customise the appearance of the grey image, trying to keep the total percentage of all three combined to around 100%.



3 Open the Apply Image window from the Image menu. Although this is supposed to be a technique for combining channels and layers between two images, it can convert a single image to grey based on single channel data. Choose a channel from the Channel drop-down list and ensure the Blending Mode is set to Normal. Interesting effects can also be created in Lighten and Screen blending modes.



4 Open the Calculations window from the Image menu. This feature is intended for blending channels between several images, but you can use it to generate mono photos as well. Source 1 and Source 2 should be the same, as should the Layer and Channel selections. Choose Normal from the Blending Mode menu, or experiment with other blending modes, such as Multiply.



## Scan to green

When scanning a photo as greyscale, your scanner will scan in colour as normal before conducting its own grey conversion. Cheap software may simply dump the red and blue channels, serving up the untouched green channel as the greyscale scan. Unless you have great faith in your software, it's always best to scan in colour, and make any monochrome conversions afterwards.



## Duotone reminder

Don't forget that you can still use Photoshop's Duotone feature (see page 25) if what you're after is a custom-tinted monochrome image. First convert the image to Grayscale, then to Duotone from the Image > Mode menu. Specify up to four spot colours and edit them as necessary using Curves. You can always convert the result back to RGB or CMYK mode for further editing.



# Negative colour inversions

Invert colours to create negative visual effects, and to prepare edge masks for sharpening



## No photo negatives

While the Invert command produces a colour wheel negative, this isn't the same thing as a 'negative' in relation to colour negative film. Color print film contains an orange mask in its base, which would simply be converted to bright blue by the Invert command. Colour photo negatives should be scanned as such before being imported into Photoshop. Black-and-white transparency negatives should convert okay.

When you apply the Invert command, all colours in an image, or current layer or selection, are converted to their relevant opposite colour. For example, red becomes cyan, green becomes magenta and blue becomes yellow. On a basic level, inverting colours is fun for producing special visual effects, but you can also use it to reveal shadow or highlight detail which can then be refined as edge masks and converted to selections for custom edge sharpening. This latter technique is outlined below,



Simple inversions switch pixel colours to those at the opposite side of the colour wheel, often producing surreal and dreamlike effects

although it's not really a colour edit. The keyboard shortcut for Invert is [Ctrl]+[I] (Mac: [Command]+[I]).



## Hard Mix fade

Create posterised effects by applying the Invert command and then calling up the Fade window from the Edit menu, or type [Ctrl]+[Shift]+[F] ([Command]+[Shift]+[F] on a Mac). Leave the Opacity slider at 100%, because faded inverts tend to look grey, but select Hard Mix from the Mode drop-down menu. You can also produce this effect using overlapping inverted layers, adjusting the Layer Transparency blending mode.

## SHARPENING WITH INVERTED EDGE MASKS

**DUPLICATE** a channel by dragging its thumbnail on to the Create New Channel button at the bottom of the Channels palette.

**CLICK ON** this new channel to select it. Use the Image > Adjustments > Invert command to turn it into a negative, revealing the dark outlines as white.

**HOLD DOWN** the [Ctrl] key ([Command] on a Mac), and click on the channel thumbnail to make a selection from it.

**SWITCH TO** the Layers palette and click on the layer you wish to work on, such as the Background layer. The selection should still be active. If necessary use Select > Grow to expand it.

**APPLY THE** sharpen filter you prefer, such as Unsharp Mask under the Filter > Sharpen menu. This will only apply to the selected areas, in this case the shadows and dark outlines.

# Colour salvaging with Equalize

So single-minded it's practically stupid, Equalize may be your last hope for problem photos

**T**he Equalize command, located under the Image > Adjustments menu, could be described as being similar to Photoshop's Auto correction features except for two big caveats: it can't be customised and it doesn't always improve your image. What Equalize does is analyse the brightness values of all the pixels in an image and then redistribute them evenly across the entire range of brightness levels. In other words, it re-maps the darkest and lightest pixels to pure black and pure white respectively, and then

shifts the brightness value of every other pixel in regulated steps between the two extremes. Ordinarily you wouldn't apply the Equalize command to colour images, although the technique below is an exception. Instead, it's a highly-valuable quick fix for scanned monochrome photos which appear too dark or too pale compared with their originals. When using the Equalize command in Photoshop CS, keep the Histogram palette open so that you can see the kind of effect – destructive or otherwise – it has on pixel data.



## Based on selection

When a selection is active in your image, the Equalize command asks you whether you want to equalize just that selected area or equalize the whole image based on the range of pixel colours in that selected area.

The latter option may be helpful when you're trying to shift colours in a universally-regulated fashion, but there may be some odd colours lurking in the background which you don't want redistributed.

## BEYOND BLACK AND WHITE

### Mono photos aren't the only images to benefit from equalisation

Try the Equalize command on a colour image and it's likely to do one of three things: make it darker, saturate colours and increase contrast, or nothing much at all. But there's one use for Equalize that's worth remembering: it can partly salvage very dark and over-saturated images. The photo shown here is very dark and shot with deep red gels, yet it couldn't be corrected without much slaving over Curves. The Shadow/Highlight command would do nothing to help. The Equalize command, however, pulls the image back from the brink by redistributing the tones, reducing contrast and sucking out the over-saturation, ready for final correction in Curves.



*The Equalized version of this photo (right) isn't great, but it's a helpful first step before reworking those skin tones*

# Black and white solids

Turn colour images into high-contrast versions comprised of solid black and white



## Iconic graphics

*Images which have been treated with the Threshold command can be imported into a vector graphics program such as Adobe Illustrator or CorelDraw for easy tracing. Having traced a vector graphic from the image, you can resize it and incorporate it into other artwork very simply. You may even want to try applying Threshold to create the traceable basis for simple iconic graphics and logotype elements.*

**P**ure black and white photos are stylish and versatile – and here we're talking about images made up only from areas of solid black and solid white, with no grey midtones. You learned how to produce this kind of effect when converting an image to Bitmap mode on page 24, but you can do it more effectively without sacrificing the current image mode using the Threshold command under the Image > Adjustments menu. The big advantage is that the Threshold window provides a slider control and a histogram to guide

you, so that you can test how the black-and-white conversion is applied at different locations along the tonal range. In other words, you get to specify precisely where the threshold between black and white should fall, with a full preview in the main image window. The final image remains in its original mode, whether RGB, Grayscale or another. One thing it can't do, however, is apply halftone screens and dithers like the Bitmap command can. But threshold images reproduce very well on photocopiers just the same.

## LOCATE HIGHLIGHTS AND SHADOWS

The Threshold window reveals valuable image detail for editing

Try this trick for locating and marking extreme highlights and shadows. Call up the Threshold window, ensure the Preview option is ticked and drag the slider to the left until only a few black speckles are visible. These are the darkest shadows in the image. Hold down [Shift] and click on this area; this adds a colour sample reference target in that location. Now drag the Threshold slider to the right, until only a few white areas are still visible. These are your highlights. [Shift]+click on this area to set a second target. Cancel the Threshold dialog, open Curves or Levels and you now have a pair of shadow and highlight targets to click on with the Eyedroppers.

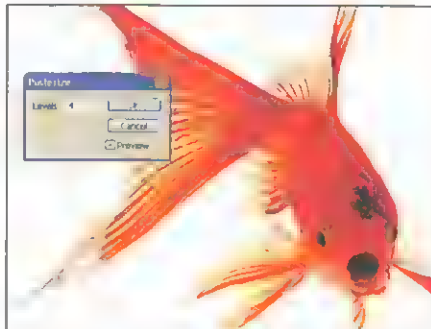


*Use Threshold as a brightness analysis tool, or apply it to images to create striking high-contrast effects*

# Posterize special effect

Recolour an image with a handful of fixed colours applied in a set of contiguous, flat areas

**G**enerally, posterisation is an undesirable side-effect rather than a deliberate special effect. Posterisation is the re-rendering of continuous tone images such as photos and gradient graphics with stepped tones. Sometimes printing graphics at too high a resolution for your printer will cause 'banding' to appear in gradients – this is the same as posterisation. But Photoshop's Posterize command, under the Image > Adjustments menu, enables you to apply the effect on full-colour and greyscale images in order to



*The lower the number of levels, the more stylish the Posterize effect becomes, although you can't drop to less than two levels*

reproduce them with a small number of colours in big flat areas – you get to choose the number of colours too.



## Choose your colours

To apply posterisation colours of your own choice, convert the original image to Grayscale mode under the Image > Mode menu. Apply the Posterize effect, then convert the image back to its previous colour mode. Now convert it again, this time to Indexed Color mode with the Palette option set to Exact. You can now open the Color Table and change the small number of specific greys into the colours you want one by one.



## Gradient steps

You can combine posterisation levels with a gradient map, using stepped locations along the gradient as the source colours for the fixed tonal steps. Our creative colour project starting on page 112 shows you how to do this. For more information on how to go about applying and editing gradient maps, see the next page.

## WHAT POSTERIZE DOES

- **POSTERIZE** 'levels' indicates the number of tonal levels or brightness values for each channel in an image.
- **LEVELS** of posterisation are not indicative of the number of visible colours in the composite image and should not, for example, be confused with choosing an overall number of colours for Indexed Color mode.
- **CHOOSING** four tonal levels in the Posterize dialog window therefore gives 12 different colour values in an RGB image: four each for the red, green and blue channels.
- **COLOURS** in the posterised image are chosen automatically based upon the dominant colours in the original image, and all other pixel values are shifted to their closest match among these.
- **CHANGING** the number of levels will invariably change all the posterisation colours, rather than add extra colours to an existing set.



# Gradient maps

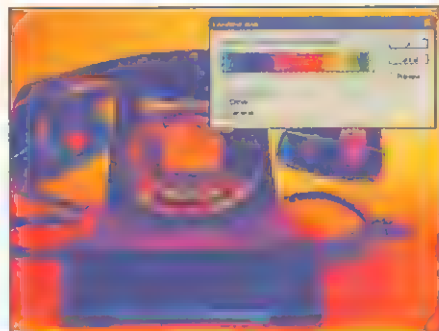
Re-map the colours in an image to those of a custom gradient to produce unusual results



## Adjustment layer

Applying a gradient map irretrievably replaces all the colours in an image (unless you Undo). You can't change the gradient map later without reapplying it over the top, causing very evident deterioration of the image. A more flexible approach is to apply the gradient map as an adjustment layer, either from the Layer > New Adjustment Layer menu or from the New Adjustment Layer button at the bottom of the Layers palette.

The previous chapter explained ways of replacing one specific range of colours with others. The Gradient Map feature goes one step further by changing all the colours in an image to a partly-random set based on a colour gradient. Located under the Image > Adjustments menu, the command literally remaps the equivalent greyscale range of tones in an image to the colours from a specified gradient fill. A simple two-colour gradient will produce a clean two-tone result, while multi-step gradients can give rise to weird



Unlike gradient fills or overlays, a gradient map uses the colours in the gradient to replace those in the image itself

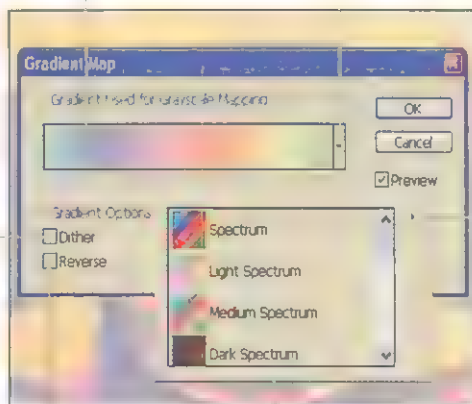
and wonderful effects. Although a little unpredictable, gradient maps can be edited for greater precision.

## APPLY A GRADIENT MAP

The currently-selected gradient is previewed here. Click on it to open the Gradient Editor, as shown on the opposite page.

When ticked, the Dither option adds random noise to smooth the appearance of the gradient and prevent banding, although this is rarely evident in photos.

The Reverse option simply switches the direction of the gradient, using the same colours but in reverse order across the tones.



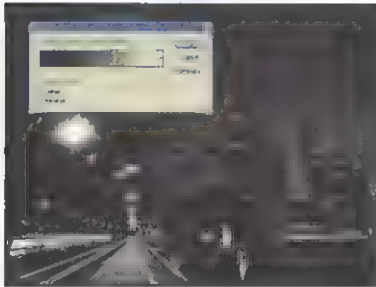
Click on the gradient menu arrow to view a drop-down list of the gradients available, either as swatches or in list format.

The arrow here opens a menu from which you can load, save and alter the listing display of the gradients currently available to you.

Select a gradient from this list (normally directly under the larger gradient preview, but shifted to one side here to reveal the Gradient Options).

# Working with gradient maps

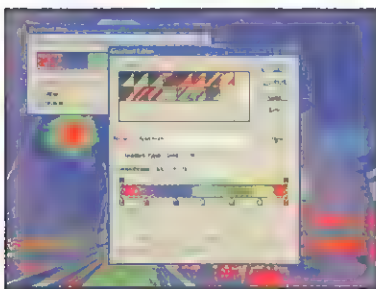
See how gradient maps can be applied and customised to get the effect that you want



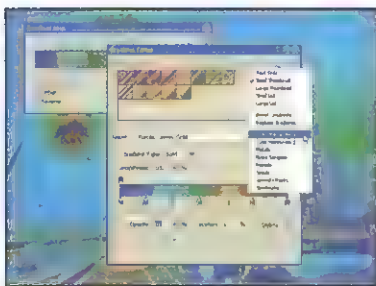
1 With a colour image open, open the Gradient Map window from the Image > Adjustments menu. By default the plain Foreground to Background gradient may be selected; in our case, the current black Foreground and white Background colours have apparently turned the photo into a monochrome image.



2 Click once on the gradient preview bar to open the Gradient Editor window. You can choose a different gradient to apply to the current image by clicking on any of the Preset swatches. This window is exactly the same as the standard Gradient Editor first seen on page 39. Clicking on the New button duplicates the current gradient, enabling you to rename and edit it as you wish.



3 As you can see, choosing another gradient immediately updates the preview in the main image window, so that you can see the effect it will have. As you adjust the gradient, the preview is updated accordingly so, although the initial effect is random, you have plenty of opportunity to adjust it before clicking OK.



4 Photoshop comes supplied with a number of small groups of preset gradients. You can choose any of these groups from the Gradient Editor Presets menu as shown, either adding them to the current list of Presets in the window or replacing them. Use the Reset Gradients command to return the window back to its default list of presets.



## Fill commands

All the uses of solid colours and gradients in this Focus Guide concentrate on image editing rather than painting or filling selected areas. Don't forget, then, that both solid colours and gradients can be applied within special Fill Layers, created from the Layer > New Fill Layer menu or from the New Fill Layer button at the bottom of the Layers palette. You can also apply a direct gradient fill with the Gradient Tool (see page 38).



## Save your sets

Any new gradients you create or edit are automatically remembered between Photoshop sessions as part of the program's preferences file. However, if you suffer a system crash and the preferences file gets lost or corrupted, you'll lose your custom gradients. It's best to save them using the Save button in the Gradient Editor for easy reloading when necessary.

# Digital photo filters

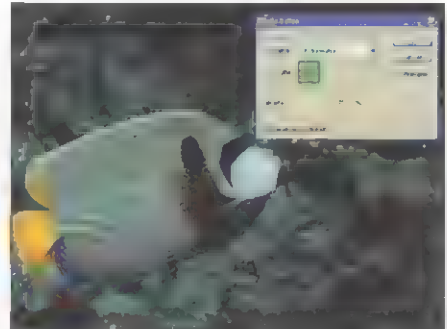
Mimic the art of the photographer with the help of the Photoshop CS coloured lens filters



## Warming and cooling

Four of the Photo Filter presets mimic actual camera filters. Warming Filter (85) and Cooling Filter (80) are colour-conversion filters that tune the white balance; that is, they work on the colour temperature of the light in the image. Warming Filter (81) and Cooling Filter (82) are light-balancing filters that adjust the colour quality throughout an image, rather than just basing its correction on white areas.

Photoshop CS includes a Photo Filter command in the Image > Adjustments menu. This applies a subtle adjustment to an image in much the same way as a colour lens filter is designed to adjust the colour balance and temperature of shots when attached to a camera. The effect is quite different to just adding a transparent fill layer to tint an image, because Photo Filter works in conjunction with the existing colour balance and tonal range of an image rather than applying a fixed tint value across all the pixels universally. Even



As well as warming and cooling the look of photos, filters can be used for further enhancing the existing colour theme of an image

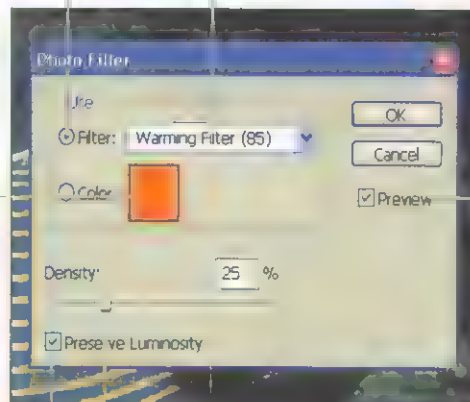
a high-density setting preserves pure whites and blacks, while adjusting intermediate tones differently.

## SPECIFY A FILTER

Choose between any of the preset filters provided with Photoshop, or create your own based on a custom colour.

Click on the Color swatch to open the Color Picker window. While it's open, you can also pick up colours from the Swatches palette.

Tick the Preserve Luminosity option in order to ensure that the image isn't darkened by the application of the colour filter.



The Filter menu includes four 'real-world' filters plus an additional 14, any of which can be customised using the Color swatch below.

Always have the Preview option ticked so that you can see the effect of your filter settings within the main image window.

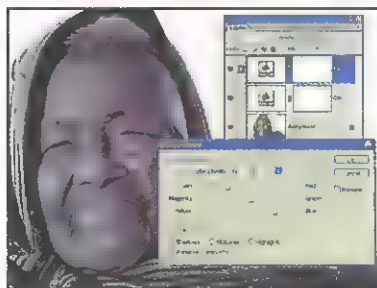
The Density slider allows you to adjust the intensity of the filter. The default value is 25%, with the best results achieved below 75%.

# Beyond duotones and tritones

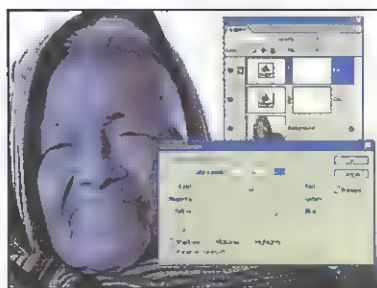
Create a unique two- or three-colour effect that varies in line with an image's tonal range



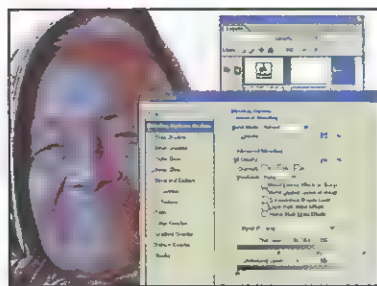
**1** Start with a colour image which has been desaturated. Open the Layers palette, as you're going to add a couple of adjustment layers. Select the Color Balance command from the Layer > New Adjustment Layer menu. In the Color Balance window, choose Shadows in the Tone Balance options and then drag the top slider towards Red, the middle one towards Magenta and the bottom one towards Yellow.



**2** Click OK. Now create another Color Balance adjustment layer in the same way (or use the New Adjustment Layer button at the bottom of the Layers palette). In this second Color Balance window, set Tone Balance to Midtones and drag the top slider towards Cyan and the bottom slider towards Blue, leaving the middle slider alone.



**3** Keep the same Color Balance window open, but now set the Tone Balance to Highlights. Leave the top two sliders centred, and drag the bottom slider towards Blue. Click OK. Over these three steps you've assigned a reddish hue to shadows, a purple to midtones and a blue to highlights. But you can't see all three at once just yet.



**4** Go to Layer > Layer Style > Blending Options to open the Layer Style window at the Blending Options section. There are two grey gradient ramps; click the left-hand black marker underneath the ramp labelled This Layer and drag it towards the middle. Hold down [Alt] ([Option]) and pull half the marker further to the left. Your image now uses multiple colours over different tonal regions.



## Why not duotones?

The principle behind duotones (and tritones and quadtones) is the reproduction of a greyscale image using a colour mix instead of plain greys. So the only difference between highlights and shadows is the amount of the colour applied to those areas. The effect shown on this page, on the other hand, applies one colour for shadows and another for highlights, with a smooth transition between them



## Channel Mixer

As an alternative to Photoshop's Duotones feature, try using the Channel Mixer. First desaturate your colour image (see page 72) and then open the Channel Mixer window from the Image > Adjustments menu.

Don't convert to Monochrome; just select a channel to work on and adjust the sliders carefully to apply a tritone- or quadtone-like effect. Select another channel, and drag the sliders again to develop the colour mix further.



# Blending colour overlays

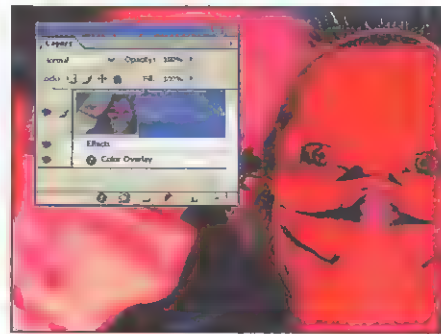
Mimic the effect of strongly-coloured gels by applying blended overlays as a layer style



## Layers palette

Many commands normally chosen from the Layer menu are available directly in the Layers palette. The row of buttons at the bottom includes one for creating adjustment layers and another for layer styles. The Layer Style button is greyed out for locked layers, so if you want to work on your Background layer, double-click on it to unlock it.

**C**olourising images with a colour overlay is a common task for digital photographers. This is often done in photo-editing software by adding a layer, filling it with a colour, and assigning to that layer an appropriate transparency blending mode such as Overlay or Color. Photoshop provides an additional method of doing this by including Color Overlay as an optional attribute within its Layer Style feature. The Color Overlay feature is just one small element devoted to recreating the gel-lit



A default red colour overlay layer style was added over this colour image, given the Overlay blending mode and reduced slightly in Opacity

effect of professional photography, and conveniently locks the effect to particular layers.



## Blending mode scroll

When you select a blending mode from the drop-down menu in the Layer Style window it becomes highlighted until you click somewhere else. As long as it remains highlighted, you can then tap the Down cursor key on your keyboard to select the next blending mode in the menu and see it previewed in the main image window. Keep tapping the Down key to scroll through the blending modes one by one.

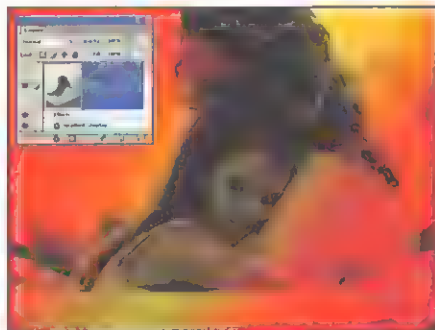
## COLOR OVERLAY SETTINGS

- ☐ **OPEN THE** Color Overlay settings ready for editing by choosing the Layer > Layer Style > Color Overlay command.
- ☐ **CHOOSE A** transparency blending mode from the Blending Mode drop-down menu. All of Photoshop's blending modes are included.
- ☐ **NORMAL** blending mode blots out your image behind a solid colour, unless you make it transparent by dragging the Opacity slider to the left.
- ☐ **CLICK ON** the small colour swatch rectangle next to the Blending Mode menu to open the Color Picker window, and change the colour to something else.
- ☐ **WHILE THE** Layer Style window is open, you can drag in the main image window to scroll around your image. Hold down the [Ctrl] key ([Command] on the Mac) to toggle on the zoom in tool, or the [Alt] key ([Option]) to zoom out.

# Gradient overlay effects

Apply graduated colour filters and subtler gel effects as Layer Style overlays

**A**nother colour feature within the Layer Style dialog window is Gradient Overlay, the gradient equivalent of Color Overlay. You can call up the Layer Style window from the Layer > Layer Style menu, or by clicking on the Layer Style button at the bottom of the Layers palette and choosing the effect you want – the settings are a little more complex than for plain Color Overlays. Use Gradient Overlays to mimic non-flat gels which mix with other gels, or for adding graduated filters such as those for recolouring the sky in



*Even simple gradient overlays like this reflected yellow/orange style can be used to enhance the mood of photos and add subjective focus*

landscape shots, or drawing the viewer's attention to particular subjects within an image.



## Radial spotlight

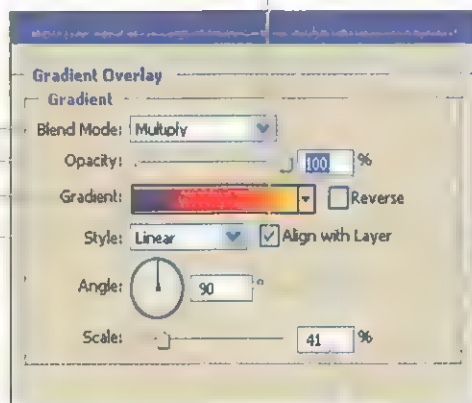
Try this to create a gel spotlighting effect with portrait photography. Add a Gradient Overlay using a simple gradient from a bright colour to a darker colour and set its Style to Radial. Give it an Overlay Blending Mode and reduce the Opacity a little. Untick the Align With Layer option and drag the gradient, so that the bright centre of the radial rests over the face of the person in your photo.

## EDITABLE ATTRIBUTES FOR GRADIENT OVERLAY

Pick a transparency blending mode from the Blending Mode drop-down menu and make it more transparent by dragging the Opacity slider to the left.

Click on the menu arrow next to the Gradient preview swatch to view more choices, or click on the swatch itself to open the Gradient Editor.

Choose between Photoshop's five gradient styles: Linear, Radial, Angle, Reflected and Diamond. Use the Reverse option above to change the colour direction.



Align With Layers centres the gradient within the layer. When it's unticked you can drag the gradient around within the main image window.

Alter the angle of all but Radial gradients by entering a degree value in the numeric field, or by dragging the Angle pan pot.

The Scale slider expands and tightens the spread of a gradient across the layer, much like long or short drags with the Gradient Tool.

# HOW BLENDING MODES WORK WITH LAYERS

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As well as overlapping, the colours in transparent layers can be made to blend with each other in a variety of ways. Here's a handy guide to how each blending mode works

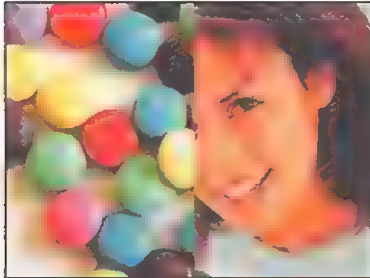
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**L**ayers are the on-screen equivalent of stacking sheets of acetate or celluloid on top of each other. Transparency in these layers allows you to see through gaps in the top layer to other layers below it in the stack, making possible effects like photo-montages. Additionally, the pixel data itself on these layers can be made transparent, so that you can see through the image on one layer to view others beneath.

### **Colour blending**

It's only when you start thinking seriously about how a pixel is made to appear 'transparent' between one layer to the next that you realise

what a sticky proposition it is. When graphics programs first introduced the transparency concept, they all followed the most basic method: fade the top object's colours away to reveal others underneath, rather like converting solid white paper gradually into frosty tracing paper. The problem, of course, is that you end up with a load of pale images because of the assumption that pixels are solid until faded away. In real life this is nonsense; stained glass can be transparent while containing very strong colours, for example. As a result, Photoshop and many other photo-editing programs now offer a whole host of alternative



**Page 86** The Normal, Opacity, Dissolve and Darken blending modes



**Page 87** Multiply, Color Burn, Linear Burn and Lighten blending modes



**Page 88** Screen, Color Dodge, Linear Dodge and Overlay blending modes



**Page 89** Soft Light, Hard Light, Vivid Light and Linear Light blending modes



**Page 90** Pin Light, Hard Mix, Difference and Exclusion blending modes



**Page 91** Hue, Saturation, Color and Luminosity blending modes

transparency methods known as 'blending modes', in which pixels interact between layers in variable ways according to their colour, intensity, grey tone and so on.

Even several years after these blending modes were introduced, most Photoshop users still confine themselves to just one or two. The reason for this is that the other modes can seem rather arcane with their funny names, and the results that you get often seem hopelessly unpredictable. This chapter attempts to put things right by offering a visual guide to Photoshop's blending modes, with a full description of what each mode is doing and how

you might expect it to act upon quite different images.

## Image samples

To demonstrate the effect of blending modes we've created a simple two-layer Photoshop document. The Background layer contains a photo of multicoloured sweets, while the upper layer contains a photo of a model's face. All the blending modes on the following pages are applied to this upper layer, and you can see the interaction with the colours in the layer below. Switching the layers, and applying blending modes to the sweets layer, would produce very different results.



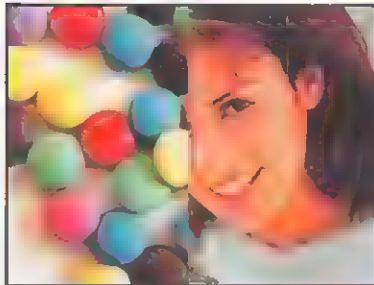
# Layer blending modes 1

We'll start by looking at Dissolve and Darken, as well as manipulating the Opacity slider



## Mode menu

Blending modes for layers are selected using the drop-down menu at the top of the Layers palette. Blending modes for other Photoshop features are distributed across the program. Brush tools, for example, let you change their blending modes from the Options bar, while Color Overlay and Gradient Overlay blending modes can be adjusted in the Layer Style window.



**Normal:** As the name suggests, this is the normal state of a layer. All pixels in the layer are 100% opaque, even if the layer background is transparent. In our example, Normal blending mode would show only the top layer (the model) and completely obscure the bottom layer (the coloured sweets). We've shown the layers side by side here for clarity.

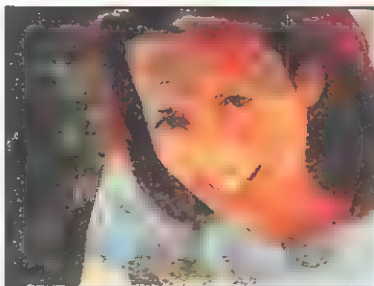


**Opacity:** This example actually shows Normal mode again, but after the opacity of the top layer is reduced to 75%. You can do this by dragging the Opacity slider towards the left, or by entering a percentage value in the numeric field. As you reduce the opacity value, Photoshop fades the intensity of the pixels in that layer, averaging them out with those in the layer below.

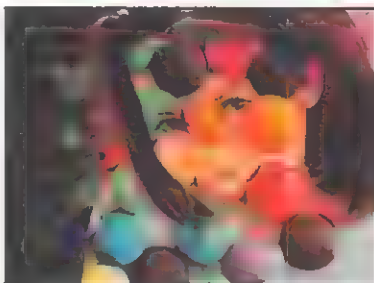


## Behind and Clear

Two blending modes – Behind and Clear – aren't demonstrated in this chapter because they're only available for brush tools rather than for colour editing in general. The Behind mode paints colour only on the transparent areas of a layer, as if you were painting on to the back of a sheet of acetate. The Clear mode paints transparency instead of colour on to a layer, as if you were using the Eraser tool.



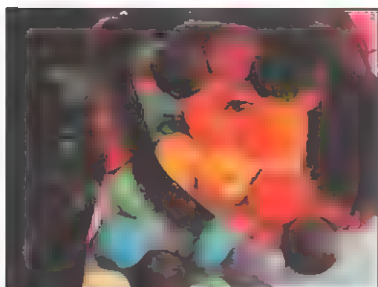
**Dissolve:** At an opacity level of 100% the top layer continues to be totally opaque, as with Normal mode. But, as you reduce opacity, a number of pixels are made completely transparent in a random, dither-like pattern. As opacity is reduced further, more pixels become transparent. In this example the Opacity is set to 75%.



**Darken:** Photoshop compares colours in the blended layer with those in layers behind it, and calculates whichever is darker on a pixel-by-pixel basis. Wherever a pixel is darker on one layer than the other, the dark pixel replaces the light pixel in the resulting image. This can produce an interesting effect with layers that contain plenty of contrast.

# Layer blending modes 2

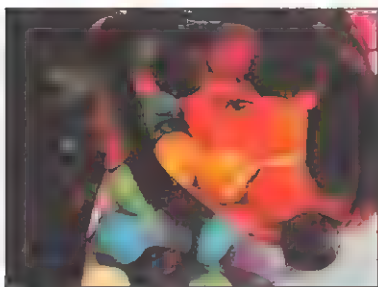
Apply basic Multiply transparency and experiment with multi-exposure techniques



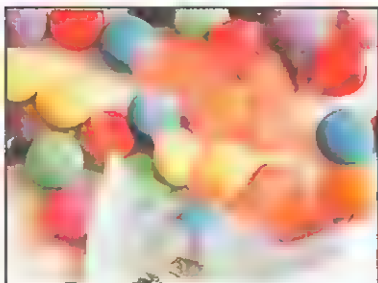
**Multiply:** Colours in the lower (base) layers are multiplied by the blending layer to produce a combination of both, which is inevitably darker. Multiplying any colour with black produces black; multiplying with white leaves the other colour unchanged. The result is akin to placing one transparency film on top of another over a lightbox, or putting two slides into a projector at the same time.



**Color Burn:** Colours in the blending layer are applied to those in the base layers to enhance contrast. The concept is similar to 'burn' in conventional photographic developing, but applied to colour rather than just light intensity. The degree of colour change is carried out in accordance with tonal values in the blending layer, so white areas will leave the underlying layer colours unchanged.



**Linear Burn:** This is similar to Color Burn in that colours in the underlying layers are darkened to reflect those in the blending layer, except with Linear Burn this combination is applied in order to decrease brightness, rather than increase contrast. As before, white areas in the blend layer allow the colours in layers below to show through unchanged.



**Lighten:** Photoshop looks at the colours in both layers and discards those that are darker, leaving only the lighter pixels from each layer. This approach is the opposite of the Darken blending mode shown on page 86. Be warned that if the base layer is a good deal brighter than the blend layer, the latter will practically vanish unless you adjust its Opacity value.



## Mode scroll

You don't need to click in the Layers palette to set the blending mode for a layer; in fact, the palette doesn't have to be open at all. As long as you've selected an unlocked layer for editing, hold down the [Shift] key and tap – or + to scroll through the blending modes. Obviously you'll still need to consult the Layers palette to find out which modes are being applied.



## Lock layer

Transparency settings can still be adjusted for a layer, even when the Lock Transparent Pixels button is clicked in the Layers palette. To make sure that neither the transparency blending mode nor the opacity level are changed you must click on the Lock All button – it's the one that looks like a padlock. The blending mode, opacity and fill settings are then greyed out, and can't be edited until the layer is unlocked again.

# Layer blending modes 3

Apply photographic dodge effects to images and get to grips with Screen and Overlay



## Instant slider

The pop-up Opacity slider in the Layers palette normally requires two clicks: one to make the slider appear, and another to select the slider control before dragging. Circumvent this process by allowing your mouse cursor to hover over the label word 'Opacity', whereupon a pair of horizontal arrows will appear in the cursor. Just click on the label and drag left and right to adjust the opacity value, as if you were using an invisible slider.



## Blend by channel

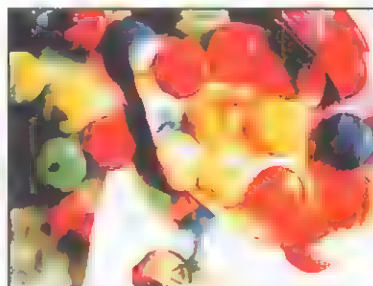
Blending modes can be applied just to selective colour channels in an image if you prefer. Double-click on a layer thumbnail in the Layers palette to open the Layer Style window and then look through the many blending options available. In the Advanced Blending section, each channel in your image is presented as a tick option. Remove ticks from channels you don't want the blending mode to apply to.



**Screen:** Colours in the blend and base layers are multiplied as inverse values, producing lighter colours in combination. Screen is essentially the opposite of Multiply; the result is akin to projecting two different transparency slides from two different slide projectors on to the same screen. It can be highly effective when one of the two layers contains mostly dark, contrasty colours.



**Color Dodge:** Colours in the base layer are brightened to reflect those in the blend layer by decreasing the contrast. As such, Color Dodge is the opposite of Color Burn on page 87, although this doesn't necessarily mean you get an opposite result; it all depends on the relative lightness and darkness of pixels in the layers.



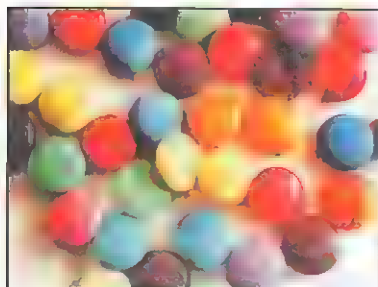
**Linear Dodge:** As the name suggests, this is the opposite of Linear Burn. So, instead of decreasing the brightness of colours in the base layer according to those in the blend layer, brightness is increased. Black areas in the blend layer will allow the lighter colours from the layers below to show through unaltered.



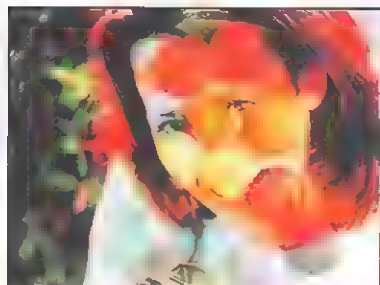
**Overlay:** This is a clever mix of Multiply and Screen, which works by overlaying the blend layer while preserving the highlights and shadows of the base layer. Where the blend layer pixels are darker, the base layer is multiplied; where the blend layer pixels are lighter, the base layer is screened.

# Layer blending modes 4

Produce passive Soft Light layer transparency or create strong, contrasty effects



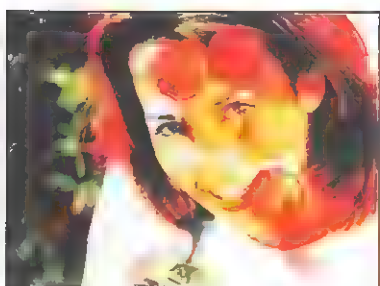
**Soft Light:** A mixture of dodge and burn effects, Soft Light darkens and lightens base colours in accordance with the blend layer colours, but in a gentle manner. The result is like projecting the blend layer image on to a print of the base layer image using a diffused light source. The mode uses a 50% greyscale threshold per channel for dodging (over 50% lightness) and burning (under 50% lightness).



**Hard Light:** Imagine you're projecting the blend layer on to a print of the base layer image again, but this time you've fitted a powerful spotlight-style lamp to the projector. When over 50% greyscale, the base pixels are screened; when lower than 50%, they're multiplied. The effect is a great deal more pronounced than Overlay.



**Vivid Light:** Colours in the base layer are burned or dodged by increasing or decreasing the contrast, depending upon the blend layer colours. The general effect is similar to Hard Light, but much more contrasty where the blend layer colour is darker than 50% grey, producing more saturated colours as a result.



**Linear Light:** This mode burns or dodges colours in the base layer depending on the blend layer colours, once again using a 50% greyscale threshold. Pixels above 50% grey are lightened, those below 50% are darkened. This tends to produce even more contrasty results than Vivid Light, but usually at the expense of hues: Linear Light blends are far less colourful than either of the original layer images.



## Layer key commands

Scroll through the layers in your Layers palette in sequence by holding down the [Alt] key ([Option] on a Mac) and hitting the square bracket keys. To skip to the top or bottom layer, hold down [Alt]+[Shift] ([Option]+[Shift]) and use the square brackets.

To move the currently-selected layer up or down in the stack, hold down [Ctrl] ([Command]) and hit the square bracket keys again.



## Transparency selection

When working on a photo montage or multiple layers you will have created layers which contain irregular areas of transparency, whether by deleting selections, using the Eraser or painting with a brush tool set to the Clear blending mode. You can convert these irregular transparency areas instantly into a selection by holding down the [Ctrl] key ([Command] on a Mac) and clicking on the layer's thumbnail in the Layers palette.



# Layer blending modes 5

Construct unusual and creative effects by blending layers in increasingly complex ways



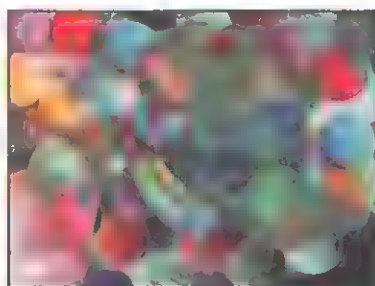
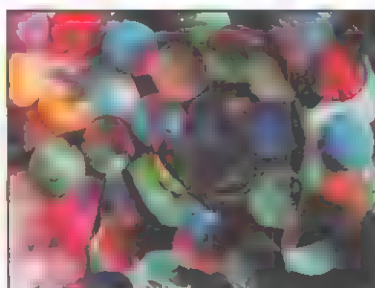
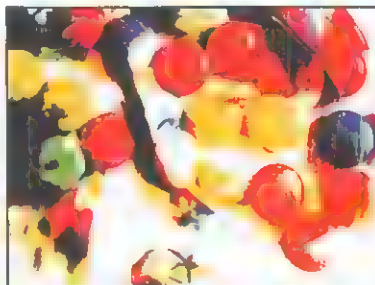
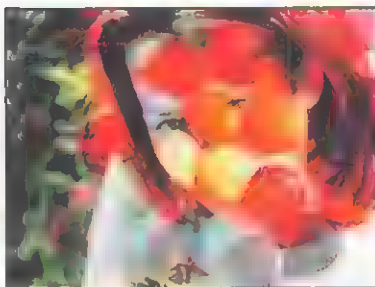
## Opacity reminder

Many of the esoteric blending modes on this and other pages look as if they should be applied as-is, and therefore must work as applied, or not at all. In fact, they can be customised by adjusting the Opacity slider. All the examples here have been blended at 100% opacity, but you can alter the results quite dramatically – especially for modes which employ a threshold for applying an effect – by reducing this value.



## Difference comparison

The Difference blending mode can act as an analysis tool for comparing identical or similar images. With the two images in separate layers, set the top layer to Difference mode and check the result for blemishes. Any significant difference between the two layers will shine out like a beacon, and you can adjust the Opacity slider to analyse further.



**Pin Light:** This is a combination of the Lighten (page 87) and Darken (page 86) modes. When the blend layer colours are lighter than 50% grey, any pixels in the base layer which are darker are replaced, while the rest show through. When the blend layer colours are darker than 50% grey, pixels in the base layer which are lighter are replaced, while the rest show through.



**Hard Mix:** The base layer colours are applied to the luminosity values of the blend layer pixels, and these are then converted down to a posterised combination of just eight colours: red, green, blue, cyan, magenta, yellow, black and white. The effect is either fabulous or appalling, depending upon your point of view; but it's undeniably stylish.



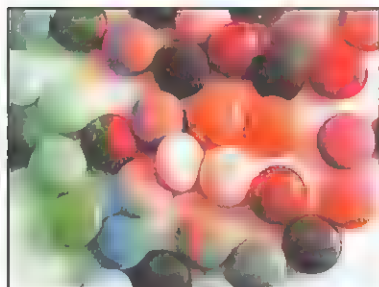
**Difference:** Here the blend layer colour is subtracted from the base layer colour, or vice-versa, depending upon which of the two has the greater brightness value. This is a difficult blending mode to predict the outcome of, but you should expect a fair amount of colour inversion. Blacks are left unchanged, but white areas will invert.



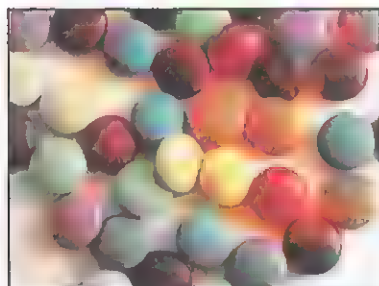
**Exclusion:** The name of this mode isn't a lot of help in explaining what it actually does; basically Exclusion is a variation on the Difference mode, with less-pronounced contrast. It produces essentially the same hues and inversions as the Difference mode, but in a more muted fashion.

# Layer blending modes 6

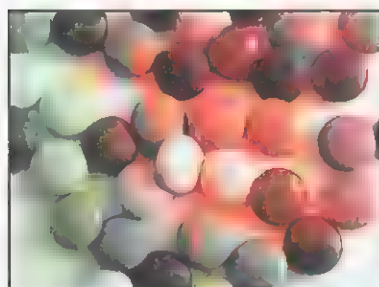
Let Photoshop use luminance, saturation and hue to determine how layers will combine



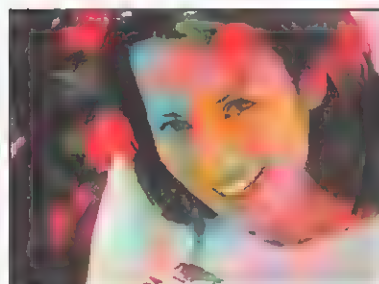
**Hue:** The colour perception concept of hue, saturation and brightness was first explained on page 13. Here, Photoshop picks three components from the pair of layers being blended. For the Hue mode the result is calculated from the hue of the blend layer and the saturation and brightness (luminance) of the base layer.



**Saturation:** This time, the resulting colours are calculated from the hue and brightness of the base layer and the saturation of the blend layer. As with the Hue mode, Saturation tends to generate very muted final images in which the blend layer on top is often difficult to see, while certain colours in the base layer end up rather pale, or even completely desaturated to grey.



**Color:** This result is calculated from the brightness of the base layer colours and the hue and saturation of the blend layer colours. Notwithstanding the example here, Color mode can produce interesting effects. But pure whites in the blending layer will simply render the base layer as fully-desaturated grey. Color mode is popular as a brush blending mode when hand-colouring photos.



**Luminosity:** Here the calculation system is the opposite of Color mode, in that the effect is produced from the hue and saturation of the base layer and the brightness of the blend layer. Thus the blend layer image is clear enough this time, while it's the base layer that's difficult to make out.



## Blending range

You can choose the precise tonal range within layers to be affected by transparency blending modes.

Double-click on a layer thumbnail to open the Layer Style window and adjust the greyscale ramp sliders at the bottom: one for This Layer, the other for the Underlying Layer. We touched on selecting tonal ranges in the Layer Style window back on page 81.



## Pixels in channels

Transparency blending modes base their calculations on pixels in colour channels, not on composite colour as you see it on-screen. You can therefore apply blending modes from a layer to combine channels within and between images in order to generate entirely new images. This is done using the Apply Image command, demonstrated briefly on page 73.

## Chapter 8

# GETTING YOUR COLOURS RIGHT FOR PRINTING

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Make sure the colours you print are the same as those you see on-screen with Photoshop's colour management features. Here's our guide to getting it right every time...

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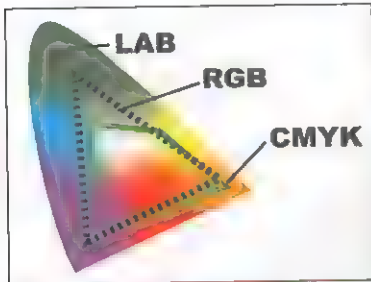
**C**olour management has been an integral feature of Photoshop since version 5.0. Originally aimed at professionals, colour management has become accepted as integral to graphics and digital photography at all levels – but that's not to say that everyone understands the concept. The theory is simple: you want colours to appear in print as they do on-screen. The problem is that Photoshop doesn't make it obvious how to ensure that this is the case. This chapter should put you straight.

### Calibrate your devices

For thoroughness, we'll begin with a quick overview of precisely why

colour management is deemed necessary, and what kind of issues it's intended to address. You'll learn about the important concept of 'working spaces' within Photoshop, and how these relate to colour gamuts and hardware device 'profiles' as part of a general colour-managed 'workflow'. If you're not yet familiar with these terms, you soon will be.

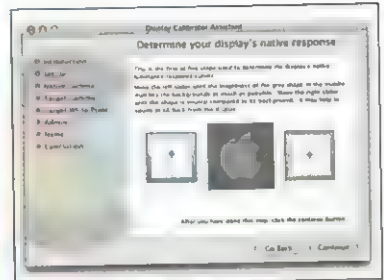
It's not all about theory, however: later in the chapter we'll show you how to calibrate your monitor, and explain how to go about generating colour profiles for your scanner, digital camera and colour printer. Without properly-calibrated and



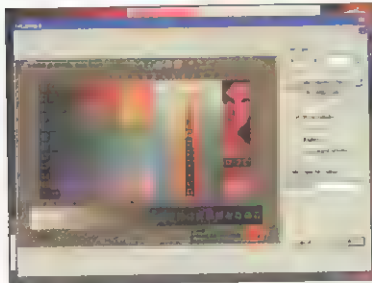
**Page 94** Discover how colour spaces and gamuts affect scans and printouts



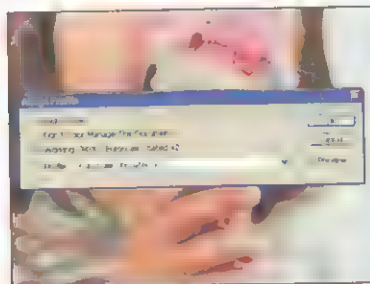
**Page 95** Set up a workflow to avoid colours being converted incorrectly



**Page 97** Calibrate your Windows or Mac display for Photoshop step-by-step



**Page 98** Learn how to obtain colour profiles for scanners and other devices



**Page 101** Learn about assigning and converting profiles in images



**Page 108** Follow our tips for spotting out-of-gamut colours before you print

profiled equipment, colour management simply won't work.

## Interface challenge

The second half of this chapter explains in more depth how to configure Photoshop to use colour management successfully. While Adobe is no doubt proud of its colour management interface, most people find it utterly unfathomable. So we'll lead you by hand through the ins and outs of assigning profiles to images and converting one profile to another, and tell you when to leave embedded profiles well alone. Then we'll delve into the detail of Photoshop's Color Settings

window, to make sure you have everything set up as it should be.

More real-world advice rounds off the chapter, with guidance on spotting problems before they occur. Photoshop comes with several features for identifying on-screen colours which won't print properly, and we show you where they are. Finally, you'll learn how to ensure that printouts conform to the right colour profiles. If you were never quite sure what colour settings to customise in Photoshop's Print dialog window, the tutorial at the end of the chapter shows you what to do. You'll soon find colour management becomes less of a chore.



# Colour spaces and gamuts

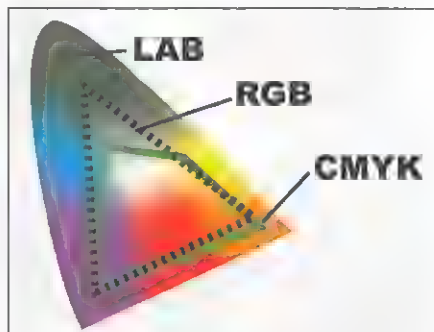
Apply your knowledge of colour perception to Photoshop's methods of handling digital colour



## Core concepts

Think of colour spaces as theories of colour perception put into practice. Photoshop's colour 'modes' are colour spaces, for example, each being a method of defining colour on a computer. A gamut, on the other hand, is the range of colours actually achievable within a colour space or by a specific colour device (display, scanner, printer and so on).

Photoshop's interface and Help pages toy around with colour management jargon, so take a moment to grasp a few buzzwords. As you learned at the beginning of this Guide, there are different ways of defining colour on a computer, and each of these could be described as a 'colour space'. The range of colours that can be reproduced within a particular colour space is known as a 'gamut'. But bear in mind that a 'gamut' can also refer to the range of colours reproduced by a particular device, not just a generic



The CMYK gamut of printed colours is always much smaller than that of on-screen RGB colours, while Photoshop itself uses LAB

colour system. So don't throw the terms around too much – and never confuse gamut with colour space.



## Big colour scans

Some professional-class scanners can capture images in LAB mode and deliver the scans to Photoshop directly in this mode as well. But you don't need a pro scanner to benefit from a big colour space, since many home and mid-range scanners can capture in 16-bit-per-channel RGB mode. These so-called 'raw' scans may not quite have the depth of LAB colour space, but it's the next best thing.

## THINGS TO REMEMBER

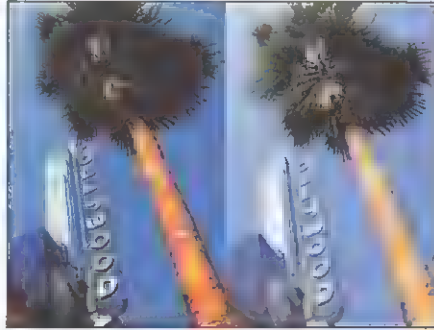
- **PHOTOSHOP** uses a LAB definition of digital colour, even when you're editing in CMYK, RGB or Indexed Color modes. LAB is employed as the intermediary format when converting from one mode to another.
- **RGB COLOUR** has a smaller gamut than LAB, but most digital images are captured and delivered to Photoshop in RGB mode anyway.
- **CMYK MODE** has a smaller gamut than RGB, so it's best not to convert images to CMYK until you've completely finished editing them.
- **WHEN CONVERTING** an image from one colour mode to another, Photoshop uses its Color Settings (see pages 102-107) to determine how colours are altered during the process.

**AN RGB** colour space can be generic and theoretical. A CMYK colour space always refers to the properties of a specific printing press with specific inks and paper.

# Towards a colour workflow

'Workflow' can seem a rather cringeworthy expression, but the concept is simple to grasp

**D**igital colour is not a constant. In the most basic terms, consider how scanners capture light while printers output ink; these are fundamentally different theories of colour perception and identify two very different colour spaces, that of RGB and CMYK. So, as a digital image moves from scanner to computer display to printer, colour is being reprocessed several times by different devices. This is known as a 'workflow'. For the workflow to run smoothly you need manage the colour data as it moves along,



*This isn't a mock-up – what you see here is exactly the same image with two different colour device profiles assigned to it*

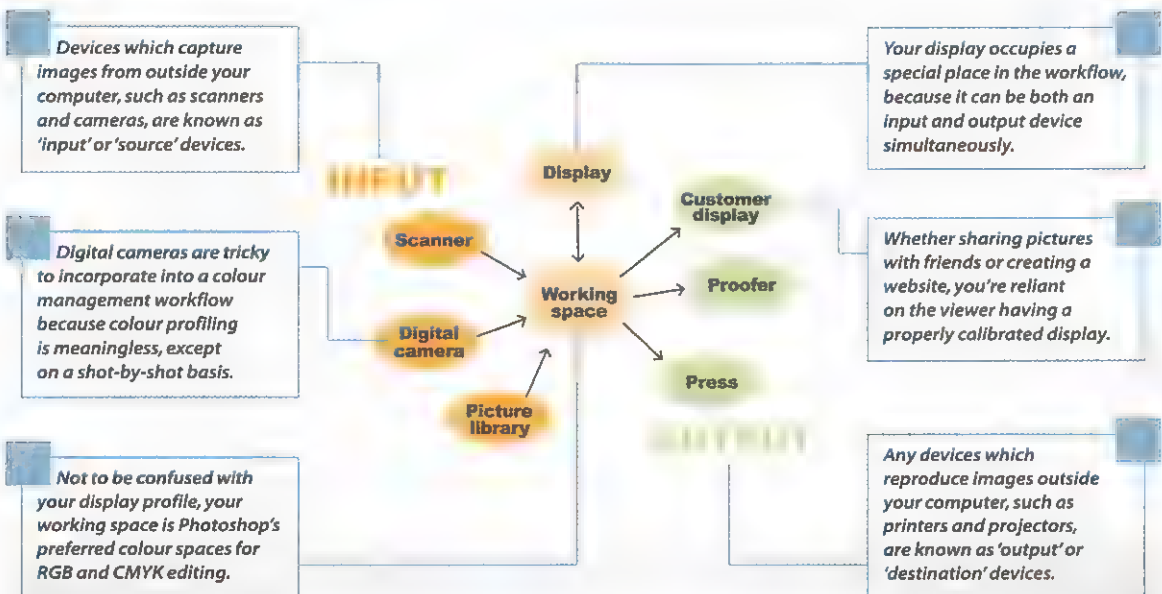
and the way to do this is to map the colour reproduction capabilities of each device as a series of 'profiles'.



## Production workflow

Modern-day print production involves a longer and more complex workflow, of which Photoshop is just one part. It invariably includes using Images in page layouts and processing these through Acrobat to Adobe PDF format before going to print. However, the principle is the same: it's all about making sure that the computers understand where the colour data came from, and where it's going.

## AROUND THE WORKFLOW



# Device profiles explained

Colour management revolves around the correct implementation of device profiles



## ICM and ColorSync

Windows computers support a built-in colour management 'engine' called ICM. On the Mac, the equivalent is known as ColorSync. These 'engines' handle the processing of digital colour between devices, as long as you've assigned appropriate profiles to them. Adobe programs, including Photoshop, can make use of Adobe's own internal engine, known as ACE.

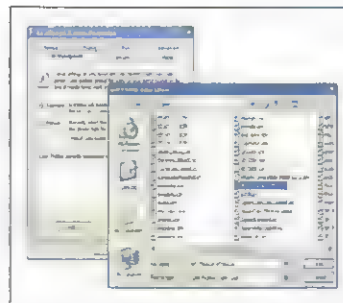
The whole idea of colour management, as we've seen, is to deal with the problem of digital colour being reproduced by very different pieces of equipment. The solution is to find out what each piece of kit is capable of, and record this information in a file on your hard disk. This file is a 'device profile'. It lists which areas of colour the device can and can't reproduce compared with the full LAB space. Once you've obtained one of these profiles for each device – scanner, camera, colour

printer and so on – all that's required is for some software to remap colour data accordingly as it's sent to or from these devices in the workflow. This software is the colour management engine, which normally runs unseen in the background and is either built into your computer operating system or lives within Photoshop itself. As long as you don't switch colour mode, the colour data within an image is never changed, but is simply adjusted on the fly using the profile when you go to print, for example.

## PROFIED PROPERTIES BY DEVICE

Each piece of your kit should know which profile to use

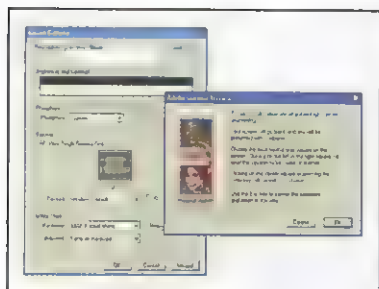
Contrary to expectations in the early days of colour management, assigning profiles as system-wide defaults gets you nowhere. Device profiles need to be linked to the specific device they refer to. This is usually done through the Control Panel (Windows) or System Preferences (Mac). For example, if you open the Properties dialog for a printer under Windows, you can add one or more profiles for that printer in the Color Management tab, if you have the profiles available. If your printer knows what profile to use, you're already halfway there. Alternatively, you can pick the right profile from within Photoshop's own Print dialog window.



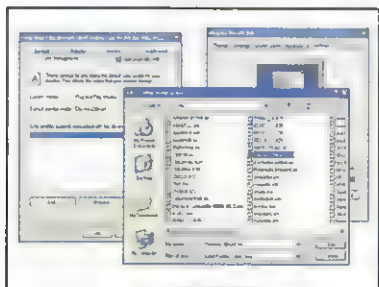
In Windows you can assign a set of custom profiles to your printer in the Properties dialog window

# Calibrate your monitor

Set up your monitor to display colours with enhanced accuracy, and record a device profile



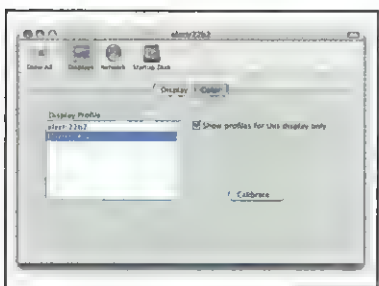
Windows users should find that the full Photoshop installation includes a Control Panel utility called Adobe Gamma. This little program makes up for the lack of any monitor calibration software provided with Windows itself. Run the utility in easy 'wizard' mode or use a more standard Control Panel dialog interface, and save the result as a colour profile document on your hard disk.



Open Display Properties in the Control Panel, or right-click on the desktop and choose Properties from the contextual menu. In the Display Properties window, click on the Settings tab and then the Advanced button. Click on the Color Management tab and then the Add button to browse for the profile document you created in step 1. Click OK to assign the profile to your display.



If you're using a Mac you won't find Adobe Gamma, because the Mac OS already provides a Display Calibrator Assistant program, launched from the Utilities folder inside your Applications folder. You can also launch the program by clicking on the Calibrate button under the Color tab of your Display System Preferences. The utility creates a custom device profile at the end.



If you've followed the Display Calibrator Assistant program properly, the profile that it generates is automatically assigned as your system's display profile. To check this has worked, or to make changes later on, open System Preferences, click on Displays and then click the Color tab. If more than one name is listed in the Display Profile pane, make sure the one you want is selected.



## Night and day

The appearance of colour and brightness on a computer screen changes as the ambient light around your desk changes. If the light is changeable at your desk – for example if you sit near a window – you should run the calibration utility afresh for different conditions. Then you can swap between multiple profiles as necessary to suit the current ambient light.



## Hardware calibration

Using software utilities to calibrate a display is good enough for most Photoshop users, but perhaps not for professionals. For greater precision, buy a utility which comes with a light-sensitive device which measures the colours off your screen more accurately, or buy a monitor which comes with its own light-measuring device attached and is capable of handling the calibration in the hardware itself.



# Calibrate your input devices

Obtain profiles for your scanner and, if possible, your camera and any picture libraries you use



## IT8 targets

An input device calibration target is a photographic print or film transparency of colour swatches which has been produced under strict conditions. The ideal digital colour data for the target is recorded as a text-based reference file. Calibration software then compares your test scan with the ideal data and produces a device profile from the results. The main industry standard target for scanners is IT8.



## Digital camera profile

Digital cameras are notoriously difficult to profile because, unlike with scanners, the quality of the light source is inconsistent. You can, however, photograph a scanner target at the beginning of a photo shoot, then use it to calibrate only those photos. One dedicated profiling utility for cameras is called InCamera, available from Colour Confidence at [www.colourconfidence.com](http://www.colourconfidence.com)

The image example on page 95 demonstrates what can happen if you have no profile for an image, or if you apply the wrong profile altogether. Until you know the input profile, colours in the original print or transparency can't be correctly interpreted to Photoshop's working space (see page 102). Photoshop can make a guess, of course, but it may not be a good one. Input profiles can be embedded in the image file for convenience, and some scanning software does this automatically. It's not essential, however; just as long



Good quality scanners come with calibration targets and profiling software, although these can be purchased separately

as you have the input device profile, you can associate it with any image later on within Photoshop.

## SOURCES WHICH NEED PROFILES

**YOUR SCANNER** obviously needs a device profile so that Photoshop knows how to display the colours it has captured.

**DIGITAL CAMERAS** may benefit from special profiling utilities.

Otherwise, treat practically all cameras as capturing images within the sRGB colour space.

**IF YOU'VE** been supplied with an image by a colleague, obtain the profile for the device used to capture it. If that colleague simply applied a default Photoshop RGB working space that's fine, but you still need to know what it is.

**WHEN SOURCING** images from libraries, ask for a profile of the device used to capture them, or ask for it to be embedded in the image file.

**IF NO PROFILE** is known, ensure your display is adequately calibrated, assign Photoshop's RGB working space to the image and edit it as needed.

# Calibrate your output devices

Profiling your printers and proofers will ensure that your colours output as you expected

**K**nowing where images were sourced from and viewing them on a correctly-calibrated display is half the battle when it comes to colour management. But to win the battle your printers need device profiles too. Unlike input profiles, which can be embedded in the image file or applied to it separately, printer profiles need to be specified from Photoshop's Print dialog windows as explained on page 111, regardless of what the embedded input profile or your current working profile might be. If you

have more than one colour printer, you need a profile for each. Strictly speaking, you need several profiles for each printer. Printed colour can look very different when printed at different resolutions, and even more so when printed on different kinds of paper. Some printer manufacturers supply multiple profiles with their printer drivers to accommodate matte and glossy papers at various output resolutions. But even these profiles may not be accurate enough for professional work, where a custom solution is required.



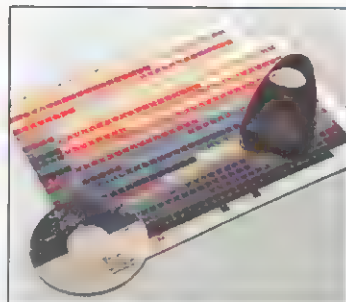
## Printing press

*For the ultimate in colour management anyone preparing images in Photoshop for a printing press will need one more device profile – that of the printing press itself. In a so-called 'prepress' workflow, this press profile is actually used as Photoshop's CMYK working space (see page 102).*

## PRINT PROFILING FOR PROS

### Highly-accurate printer profiles need not cost the Earth

Serious designers and photographers won't be satisfied by the colour profiles included by Epson, HP, Canon and so on with their printer drivers. But, until quite recently, custom profiling for printers usually involved calling in expensive consultants or sending test samples abroad. Today you can buy an off-the-shelf package called Print Profiler, which prints swatch sheets and reads them back in with a light-sensitive measuring instrument to create a profile. Starting at around £495 for a basic bundle with a handheld instrument (which can take hours to measure all the swatches) it's not cheap, but it's a fraction of the cost of the alternatives.



*Print Profiler can be purchased with a choice of reading devices, from cheap gadgets to pricey spectrophotometers*

[www.colourconfidence.com/products/printprofiler.html](http://www.colourconfidence.com/products/printprofiler.html)

# What are embedded profiles?

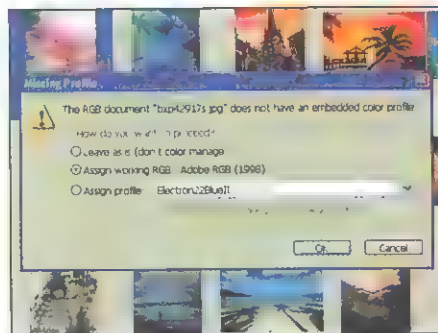
These are a vital part of colour management in Photoshop, so you need to understand them



## Always embed

As a general rule, if your scanning software supports the embedding of source profiles with scans, switch this feature on. As well as making the image and its input profile self-contained as a single file, which is handy for portability, it saves you the trouble of manually locating the profile and assigning it as the source whenever you open the image in Photoshop.

**E**mbedded profiles are no different from standard device profiles; all that happens is that the profile data, which normally resides in a separate profile document on your hard disk, is incorporated into the image file. It can then be read by graphics programs including Photoshop. RGB mode images, being device-independent for any purpose, can contain an input profile. CMYK mode images, being device-dependent for a particular printer, can contain an output profile. Photoshop can use an



Depending on how you've set up Photoshop's profile 'policies' (see page 105), you may see Missing Profile warnings, among others

embedded profile, convert one profile to another, or simply strip it away entirely.



## Digital camera input

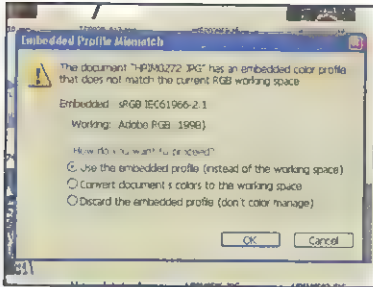
Unless you have a special profiling solution in place, digital camera images don't offer the luxury of a device profile to interpret them. Photoshop will normally expect to assign the generic sRGB profile to these images, but this tends to produce dark results. Instead, always open digital camera images directly into Photoshop's working space, ready for editing.

## EMBEDDED PROFILE RULES

- **EMBEDDED PROFILES** are simply device profiles which have been saved within the image file for convenience and portability. If you embed the profile, you don't have to remember which device was used to capture the image.
- **EMBEDDED PROFILES** are, by definition, input (source) profiles. They describe the colour capability of the device employed to capture the image, such as a scanner or digital camera. Only CMYK images can contain output profiles.
- **PHOTOSHOP** doesn't embed profiles into images automatically. You must assign a profile to an image first, then ensure that the Embed option is ticked when using the File > Save As command.
- **IF YOU PLAN** to edit an image, it's best to convert it from its input profile to Photoshop's working space (see page 102).

# Assign and convert profiles

Photoshop provides special commands for changing and removing embedded profiles

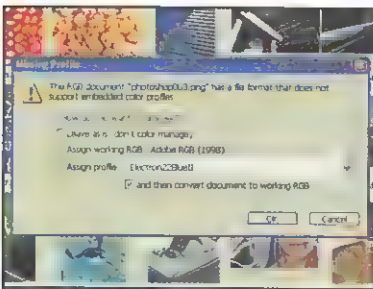


**I** If you have colour management 'policies' to warn you of missing or mismatched embedded profiles when you open an image (see page 105), a warning such as this will appear. If you're happy that the embedded profile is probably correct, and that you won't be extensively editing the colours in the image, choose the option 'Use the embedded profile (instead of the working space)'.

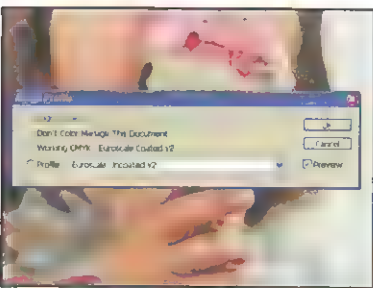


## Try it out

When you open an image and see a prompt to choose a profile for it, your choice doesn't alter the colour data in the image file. It simply interprets the colour according to what the input profile says it captured. If you're unsure which profile is the right one, don't accept any of them and use the **Image > Mode > Assign Profile** or **Convert To Profile** commands with the **Preview** option ticked to try other profiles out.



**I** Where no embedded profile is found within an image, a similar set of prompts appears in a Missing Profile warning window. Assigning the working RGB space is normally the best approach here. The key exception is when opening screenshots captured on your computer, in which case you should assign your display profile first, and then optionally convert to the working space.

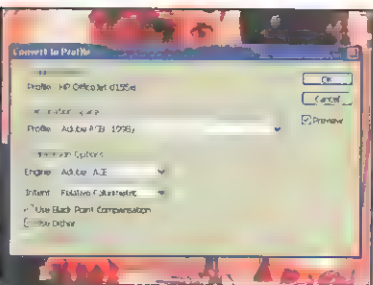


**I** While editing a document you can use the **Image > Mode > Assign Profile** command to discard any current profile or working space and use a different one instead. This may cause colours in the image to change visibly, because the colour data is remapped directly to the new profile. Remember, the colour data in the image is not changed, only the profile used to interpret it.



## Play safe

If you really don't know which input profile to choose when opening an image, go straight for a conversion to Photoshop's working space. This may not make the image appear on-screen in its true colours, but at least you can re-edit the colours according to this new working space profile, and then embed the profile when saving back to disk.



**I** If you want to reassign the profile for an image without risking a major colour shift, use the **Image > Mode > Convert To Profile** command instead. Doing so causes Photoshop to adjust the colour data before remapping it to the new profile, thus maintaining colour appearance. This may, however, cause the colour data inside the image to be changed.



# Color Settings: working spaces

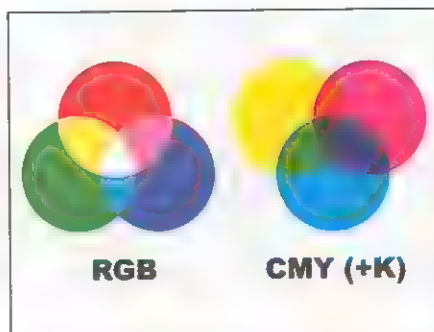
Customise Photoshop's Color Settings window, starting with the core working spaces



## **Imprecise output**

While you can be quite precise about input profiles, you'll probably end up choosing the default Euroscale Coated profile as your CMYK (output) working space. For everyday work, this is fine. However, if you're preparing images for press output, you'll need a more accurate profile, preferably one from the actual press concerned. At the very least, consider whether Euroscale Uncoated might be a more appropriate default.

Photoshop's colour management features are enabled and customised from the **Edit > Color Settings** command. This window is greyed out until you choose a preset from the Settings menu. Similar features are found in other programs, but Photoshop Elements merely lets you switch colour management on or off, not customise it. Central to Color Settings is the concept of 'working spaces', which are profiled colour spaces within which you can edit images. By definition, the RGB space is a device-independent space



Think of RGB and CMYK as opposites in every sense: in colour perception, as input/output profiles and as source/destination in the workflow

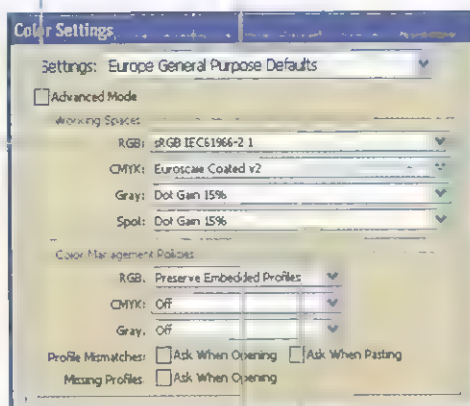
for the bulk of your work, while the CMYK space is linked to an intended destination device.

## CHOOSING THE RIGHT SPACES

Leave the **Advanced Mode** option unticked unless you want to pick a different colour management engine (advanced options are explained on page 106).

The RGB working space should be a large virtual space for editing images, such as sRGB or Adobe RGB (1998), but not your display.

Like greys, spot inks need a 'dot gain' value. This figure can be provided for a specific press by the printing company handling the job.



Adobe has prepared a number of presets for the Color Settings window, one of which is **Color Management Off** if you want to disable it.

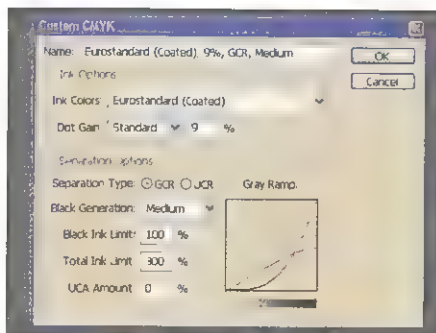
The CMYK working space should designate a final intended output such as a printing press, but not your desktop inkjet or proofer.

Enter a 'dot gain' value for monochrome images, 'dot gain' being the slight spread of printing press ink on paper which can darken halftones.

# Color Settings: custom CMYK

Even without a press profile you can still customise the CMYK working space

Having previously said that it's a good idea to use a printing press profile for your CMYK working space, we also realise that it's wildly unrealistic to expect this to happen outside the professional publishing arena. Photoshop allows you to sidestep the profile approach by providing a dialog window in which you can enter the printer's standard technical data. To reach this window, open Color Settings from the Edit menu, then click on the CMYK working space drop-down menu, selecting Custom CMYK.



Ask your printer for technical data for the press being used, and enter the information here if you can't obtain a colour management profile

This seems like a high-end feature, but you should have little trouble obtaining at least some of the data.



## Technical data

The technical data for a press is a standard piece of information which all printing companies are able to supply upon demand. You may find the data in the company brochure, but it's best to check with the print buyer or press production manager for precise details of the actual press being used for the job.

## CUSTOM CMYK SETTINGS

**THE INK COLORS** menu allows you to choose from various Eurostandard, SWOP, Toyo and other international inks, all of which are slightly different in colour. You can also enter your own values in Yxy or LAB co-ordinates if your printer has this information to hand.

**DOT GAIN** can be entered as a standard percentage, or you can apply a custom curve, again according to the technical information provided to you about the press and the paper being used.

**THE SEPARATION TYPE** and Black Generation options determine how 'rich' colours made up from a combination of all four process colours can be reduced to a lighter coverage by replacing neutral grey areas with just black ink.

**PRINTERS** will normally specify ink limits for a printing press. Too much ink causes paper to stick, due to thickness and drying problems.



## Black Generation

The Black Generation setting can be used for deliberately reducing 'rich' blacks to black-only in images when converting from RGB to CMYK mode. This can be useful when reproducing screenshots or other spot-type graphics which might otherwise print text as 100% of all four CMYK process colours. Increasing Black Generation to Heavy or Maximum causes these areas to revert to 100% black only.

# Color Settings: dot gain

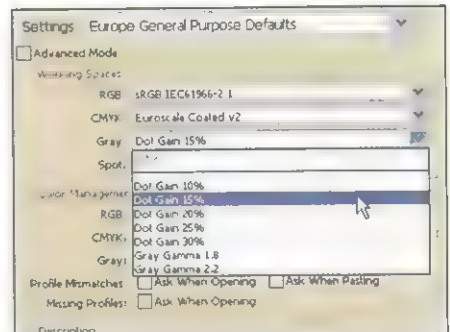
Ensure the highest possible output quality when preparing monochrome images



## Dot gain

There are two common types of dot gain caused by a printing press. The first is the inevitable result of ink droplets being pressed against the paper from the drum before drying. The other, less predictable dot gain is an optical effect caused by ink soaking inside the paper and spreading out under the surface in such a way as to be visible from the surface.

Although dot gain is something of an esoteric subject from a photo-editor's point of view, it's an inevitable side-effect of conventional printing. In practically all cases you can probably ignore the settings on this page, but one day in the future you may want to know where to specify dot gain values in Photoshop and be glad we mentioned it. The custom dot gain windows are accessible from the Gray, Spot and CMYK drop-down menus in the Color Settings window. You can use these with the CMYK process inks



When you know which printer will be handling your job, ask for dot gain data so that you can enter it here for halftone grey images

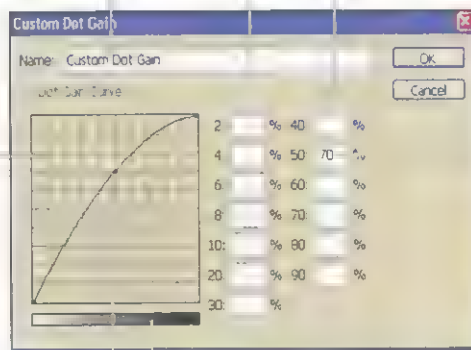
individually to correct an overall colour caste which may have appeared in your page proofs.

## CUSTOM DOT GAIN OPTIONS

Give your settings a recognisable name, including a basic percentage, so they don't become confused with other dot gain settings for other printers.

This curves-like graph represents the input/output relationship between actual dot size and the size adjusted downwards to accommodate ink spread.

Dot gain curves most typically rise in this fashion, indicating that halftone dots will look darker when printed compared with what you see on-screen.



Armed with a densitometer (a halftone ink measuring device for testing printed material), you could enter values across all potential dot gain levels.

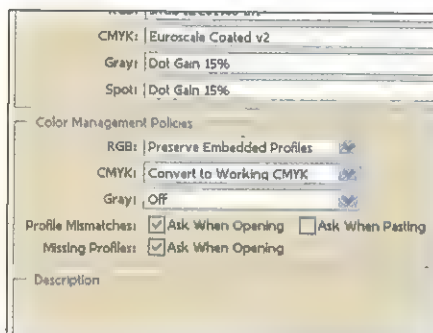
The best you'll probably end up with is a value to enter at 50% halftone. Your printer's rep should know this figure.

This greyscale ramp is a reminder of the relationship between the two axes, indicating highlights at the bottom-left and shadows at the top-right.

# Color Settings: policies

Decide how Photoshop will treat images which may or may not have embedded profiles

The trouble with embedded profiles is you can't see them, and unless you know they're there, there's not much you can do about them. So Photoshop provides a number of warning options which can be made to pop up whenever you open an image. Photoshop can run a quick check for embedded profiles and, before actually opening the image, give you the opportunity to accept, reject or change the embedded profile it thinks it has found. The effect of these warning messages was covered on pages 100



*Tell Photoshop what to warn you about when it opens images, giving you the chance to accept, replace or discard any embedded profiles it finds*

and 101, but if you like you can disable all of them and let Photoshop handle everything using defaults.



## No prompt

*Choosing the Europe General Purpose Settings preset for your Color Settings disables the prompts for profile mismatches. In this respect, Photoshop will then act like Photoshop Elements by handling everything automatically, although you do of course have the opportunity of assigning and converting profiles afterwards. You can always manually tick these options back on again.*

## THOSE POLICIES IN FULL

- ☒ **PRESERVE** Embedded Profiles assumes you wish to keep any source or destination profile that has already been embedded within an image.
- ☒ **CONVERT TO** Working RGB/CMYK/Gray automatically converts the image to the current working space, depending upon whether the image is currently in RGB, CMYK or Grayscale mode.
- ☐ **CHOOSING THE** setting Off leaves the image as it is.
- ☒ **PROFILE MISMATCHES** lets you set Photoshop to prompt you if it finds that the image you're opening has an embedded profile which doesn't match the relevant working space. This is useful if you want to get everything into the working space, perhaps as part of a larger workflow which might include page layout programs.
- MISSING PROFILES** does the same thing, giving you the opportunity to assign a profile when Photoshop can't find one at all.



## Preserve but warn

*If you're going to take the trouble to switch colour management on, you may as well make the most of it by using profiles sensibly. It's a good idea to set RGB, CMYK and Gray to Preserve Embedded Profiles, just as they are in the Europe Prepress Defaults, simply because it can be helpful to leave embedded profiles where they are.*



# Color Settings: advanced

As you get more confident try customising Photoshop's advanced colour engine options



## Description box

A box at the very bottom of the Color Settings dialog window provides quick help on the settings themselves. The description in this area changes as you allow the mouse cursor to hover over different areas of the window, saving you the trouble of launching Photoshop Help.

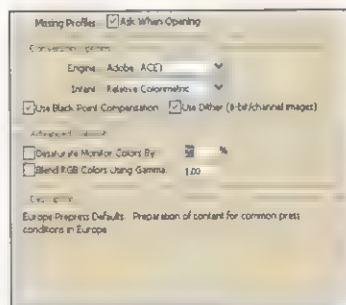
**W**hen you tick the Advanced Mode option at the top of the Color Settings dialog another couple of sections appear near the bottom. The first contains an option to choose alternative colour management engines instead of the default Adobe (ACE). In everyday use, you can leave this setting alone, especially if you're using other Adobe Creative Suite programs. It only really becomes useful if you're working within the constraints of a major workflow which may impose its own colour management system.

If no other systems are listed, then you have to stick with Adobe (ACE) regardless, although you should find that all Windows computers include an ICM option, while Macs offer ColorSync. Further down the Advanced controls you can make a precise monitor desaturation adjustment and establish a gamma setting when producing composite colour, set to a default of 1.00. The colour Intent menu lets you specify how output should be treated with regard to out-of-gamut colours and clipping (see opposite).

## BLACK POINT COMPENSATION AND USE DITHER

Learn the significance of these two tick options

Converting colours from one colour space to another remaps them by simulating the colours from the original space. This can cause shadows to turn grey and lose intensity. The Use Black Point Compensation option prevents this by ensuring the black point in the image is remapped to the black point in the new colour space, with the rest of the image remapped to the full tonal range available. Use Dither controls whether 8-bit-per-channel pixels are dithered (mixed) when converted to other colour modes, thereby reducing banding and other problems. The only side-effect is that it can increase the size of the image file. Both options are worth leaving ticked on.

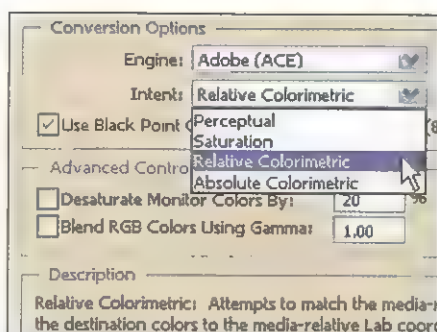


**The Advanced options at the bottom of the dialog window won't need to be changed very often**

# Rendering intents explained

Photoshop can handle the conversion from one colour space to another in several ways

On page 94 we illustrated how colour spaces such as RGB and CMYK fit into the overall LAB space. You may remember that the three spaces are quite different in scope; that is, not all of them are able to represent the same colours. This proposes a challenge to colour management when converting from one mode to another, since there may not be colours in the destination space which are direct equivalents to some of those in the source. This is the definition of 'out of gamut'. So calculations are made on those pixels



*Pick your preferred colour rendering intent from the Intent drop-down menu in the Color Settings window and the Print dialog*

to render them within the gamut of the destination. This can be done in different ways, as outlined below.



## Print intent

These rendering intents are also available from the Print window when you select File > Print With Preview. You can find them at the bottom of the window when Color Management is selected in the Show More Options section. They allow you to determine the nature of the colour conversion when selecting a profile for the printer you're outputting to

## TAKE YOUR PICK

- PERCEPTUAL** compresses out-of-gamut colours into the destination space while at the same time trying to maintain the visual relationship between all the colours. Colours may shift throughout the image.
- SATURATION** preserves the saturation level of all colours during conversion. Out-of-gamut colours have their hues and lightness changed to fit within the destination space, but their saturation remains the same.
- RELATIVE COLORIMETRIC** shifts out-of-gamut colours to their nearest equivalents in the destination space. At the same time, the highlight of the original image is remapped to the destination, along with all other colours. Overall, colours will shift, but not as much as with Perceptual.
- ABSOLUTE COLORIMETRIC** simply drops, or 'clips', colours which can't be reproduced in the destination space; only colours with a direct equivalent are used.



## Delay CMYK

The very nature of rendering intents should suggest to you that converting images to CMYK is going to adversely affect the colour. It's a predictable state of affairs, though, because there's no way that any CMYK output profile can ever match the much larger RGB working space. Some clipping or shifting of colours near the edge of the gamut is inevitable. So avoid converting to CMYK until the last moment.

# Proofing out-of-gamut colours

You can enable a visual warning for when on-screen colours can't be printed



## Warning colour

The area highlighted by the Gamut Warning feature doesn't have to be grey. Open the program Preferences by typing [Ctrl]+[K] ([Command]+[K] on a Mac) and choose the Transparency and Gamut section. Click on the grey square to open the Color Picker and select a new colour to use. Dragging on the Opacity slider adjusts the opacity of the highlight.

**G**rab a screenshot of anything colourful on your computer, reopen it in Photoshop, then convert the colour mode to CMYK. The chances are you'll see a disappointing shift in colour. This illustrates the problem of remapping colours from RGB to CMYK when there's no colour equivalent for bright reds, purples, greens, blues and so on. The result doesn't need to be a complete surprise, though, because Photoshop provides a feature called Gamut Warning under the View menu. When this is switched on, all colours which



Photoshop includes a visual warning for out-of-gamut colours, which can be toggled on and off, or left switched on all the time

can't be reproduced in the current CMYK working space are shown in flat grey to help you spot them early.



## Which intent?

Generally speaking, Perceptual rendering intent is good for photography when high quality is more important than precise colour accuracy. Absolute Colorimetric is most often used in professional proofing, where it's pointless trying to mimic gradual fall-off in certain colours when it's known that the final press can't do it. Relative Colorimetric is the most common approach for the widest variety of work, maintaining a decent balance between clipped colours and shifted colours.

## WHAT TO DO WITH A GAMUT WARNING

**DON'T BE TEMPTED** to change everything straight away. Instead, note where the problem lies and leave it until other corrections have been made. These corrections may exacerbate the problem, and you don't want to have to run a fix twice.

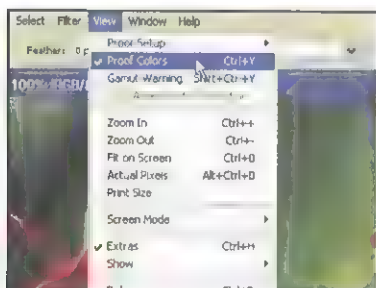
**SEE IF** the worst of the problem can be corrected by reducing saturation. It's better to desaturate bright greens yourself than allow them to be converted to ugly khaki automatically.

**IDENTIFY** if any out-of-gamut colours can be associated with particular channels and try correcting them there. A slight adjustment of just one channel could be much less harmful to the integrity of an image than tugging a composite curve in all directions.

**MEASURE** the colour values of another area of your image using the Color Sampler Tool, then try to match them in the problem area.

# More out-of-gamut solutions

Here are some other tricks for keeping your eyes on colours to see if they'll shift

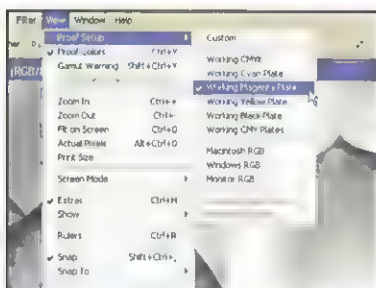


Go to the View menu and choose the Proof Colors command. This is another easy command to toggle on and off using a keyboard shortcut: [Ctrl]+[Y] ([Command]+[Y] on a Mac). In some respects this is more helpful than Gamut Warning, because it doesn't try to alert you to very small colour shifts, only those which matter visually.

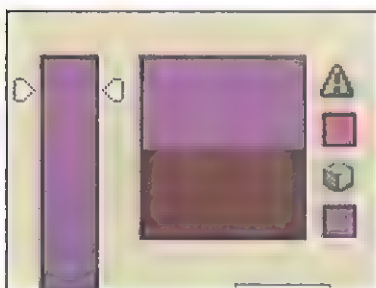


## Indexed colour

When preparing web graphics, you can convert them to Indexed Color mode and continue toggling the Gamut Warning on and off to identify problem areas. You can then locate the affected colours in the Color Table, click on them to launch the Color Picker and change the colours to a gamut-happy alternative. If you need JPG images, just change the image back to RGB mode before saving.



The Proof Colors command takes Photoshop's current CMYK working space as its base reference. Further options are available in the View > Proof Setup menu, enabling you to view an image by individual process colour plate, or even by a CMY composite before adding black. This is handy for previewing how black areas have been separated according to your custom settings.



On page 33 we introduced the Color Picker. Now let's revisit it for one feature: its Gamut Warning. If the currently-selected colour can't be reproduced in print using the current CMYK working space, it's marked with a tiny warning triangle; non-web-safe colours are marked with a cube. Click on the warning icon to shift the colours to what Photoshop thinks is a process alternative.



The out-of-gamut warning symbol makes another appearance in the Colours palette. Once again, all you have to do is click once on the symbol to force the selected colour to jump to the nearest print-friendly alternative. If you don't like the alternative, you can choose another colour entirely.



## Web colours

Don't forget that the Color Picker window provides an Only Web Colors option at the bottom-left. When this is ticked, the main colour pane and slider controls become stepped, showing only those colours available within the basic 216-strong Web set. This keeps selected colours within the Web gamut, although, obviously, not necessarily the CMYK gamut.



# Interactive soft proofing

Toggle through the different CMYK working spaces and see their effects on-screen



## Easy scroll

While the Proof Setup window is displayed, click twice in the Profile menu. This highlights the currently-selected profile (normally your working space) and closes the menu. You can now use the Up and Down arrows on your keyboard to scroll through each of the available working spaces and device profiles on your system, watching the preview update automatically in the main image window.

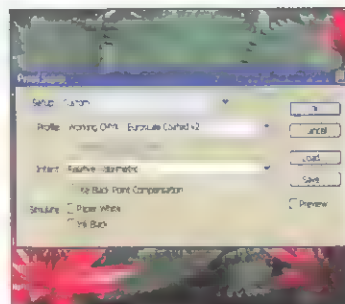
Heading off out-of-gamut areas is just one application for Photoshop's Proof Colors command. It can also be used as a powerful and fast-updating 'soft proofer'. Soft proofing is the practice of checking an image or document for accuracy and integrity while it's still on the screen. This is a major feature worth investigating, as it can save you a bit of money if you routinely print everything several times because you're never quite happy with the first few runs. As mentioned on page 109, the Proof Colors command, and

its Proof Setup submenu under the View menu, adhere to your current working spaces by default. To change this selection and start proofing interactively with as many profiles as you like, choose Custom from the Proof Setup menu. A Proof Setup window appears, from which you can pick any profile that's available to your computer to soft proof. You can also experiment with different rendering intents from the Intent menu. Don't worry about the Setup drop-down menu at the top, though; it doesn't appear to do anything.

## NAVIGATE PROOF SETUP

### How to operate the Proof Setup window for fast results

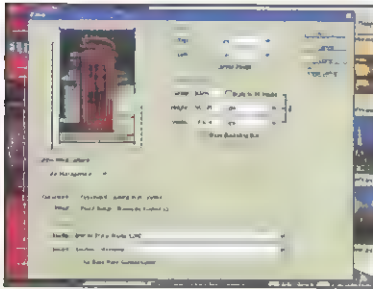
Click on the Profile menu and choose a different device profile or working space. As long as the Preview option is ticked, the effect of the new profile is shown in the main image window. You can keep changing your choice of profile without altering the image. The Preserve Color Numbers option (greyed out here) activates when previewing in the same colour mode as the image, showing how the image would look if numeric values in the file were sent to an output device with no colour conversion to the output space. You can use this to see what might happen if you sent a job to one printer having set up the working space for another.



Opening the Proof Setup window automatically selects the Proof Colors command under the View menu

# Printing with profiles

Put an end to confusion and remove guesswork when selecting output profiles for printing

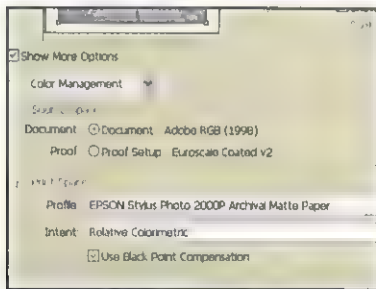


When you're ready to print an image choose Page Setup from the File menu and make sure you've selected the correct paper size. Click OK and choose File > Print With Preview or use the shortcut [Ctrl]+[Alt]+[P] ([Command]+[Option]+[P]). Tick Show More Options, choose Color Management, and choose Document for the Source Space and your printer profile for the Print Space.



## Source Space

The Source Space selection in the Print dialog window should always be set to your current Document working space. This is the default setting, so don't be tempted to select the Proof space instead, no matter how logical it might seem when printing. If the image is in CMYK mode the default Source Space should still be Document, this time being the CMYK working space profile.

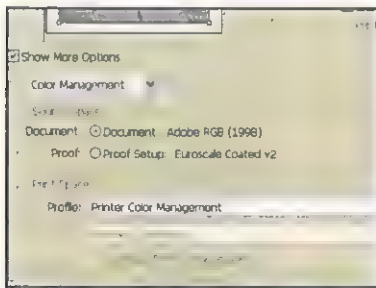


If you want accurate colour proofs from your printer, you'll need more than a generic profile. For precise proofing, you need a profile for your actual printer and the resolution you'll be printing at, and for the paper you're printing on. The paper aspect is very important for high-fidelity colour proofs.

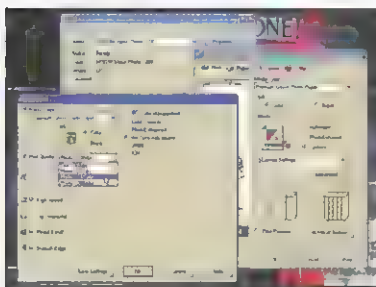


## Print Space

Likewise, the Print Space selection in the Print dialog window should be set to your immediate output device. Even if your ultimate output device will be a printing press, choose your desktop inkjet profile here if that's what you're printing to at that time. Remember, Photoshop isn't trying to proof what the image will look like on a press; instead colour management will try to make the final press output look like what you have already.



If you don't have any profiles for your printer – a surprising number of photo printers and all-in-ones continue to be supplied without any – set the Print Space Profile to Printer Color Management. At least this way you can ensure that the printer driver does its best to match colours, rather than expecting Photoshop to make sense of the profile with only half the information it needs.



Now, when you click Print, navigate to your printer's advanced colour options and set the paper type and resolution you want. Whether you selected a print profile earlier or not, choose the No Color Adjustment option (or similar). This prevents ColorSync, ICM or driver-based colour tweaks from interfering when Photoshop applies the device profile selected earlier.

## Chapter 9

# PUTTING THE THEORY INTO PRACTICE

*In this chapter...*

- ☐ Put Curves adjustment into practice
- ☐ Create the perfect greyscale every time
- ☐ Learn about adjustment layers
- ☐ See how layers ripple and interact
- ☐ Understand gradient mapping in detail
- ☐ Try out some cool posterisation effects

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Everything you need to know about mixing, enhancing and correcting colour has been covered in depth. Now let's turn a raw photo image into a striking colour poster

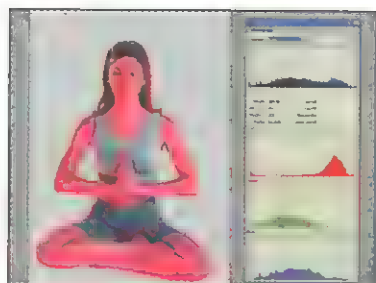
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**C**olour lies at the heart of Photoshop. You might be slaving over a hot computer building layers, painting alpha channel masks and throwing filter effects at every image you come across, but it all boils down to pixels. And each pixel is nothing more than a digital dot which only exists, as far as the visual senses are concerned, because it has a colour value. If it wasn't in colour, that pixel may as well be viewed in binary zeros and ones for all the use it would be.

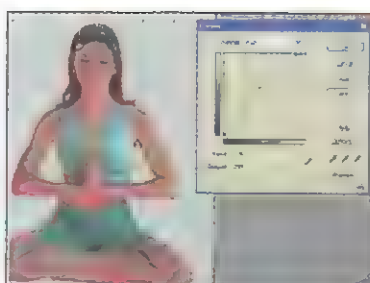
### Colour to grey

To prove the point, a central theme of the eight-page tutorial which

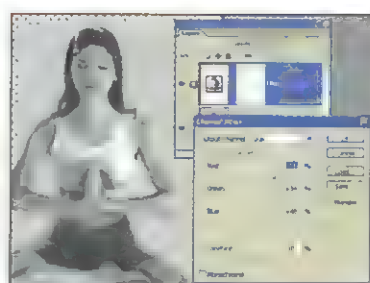
follows is the relevance of grey images to the concept of colour. As you may remember from chapter 1, digital colour is defined as greyscale tonal levels within primary colour channels. To understand colour editing properly, therefore, you need to appreciate its foundation as grey pixels within channels applied in combination. This tutorial strips the concept down to the basics by showing you how to desaturate a colour image to monochrome, and then still further to a mere handful of grey levels. Then we'll recolourise the image with gradient mapping based on those greyscale tones, and go on



**Page 114** Analyse potential problems revealed by the Histogram palette



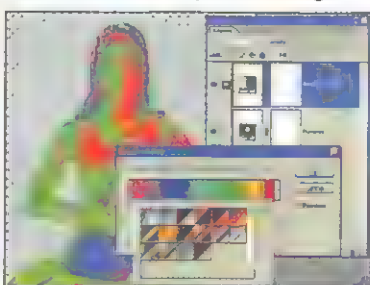
**Page 115** Use the Curves command to correct and fine-tune your raw image



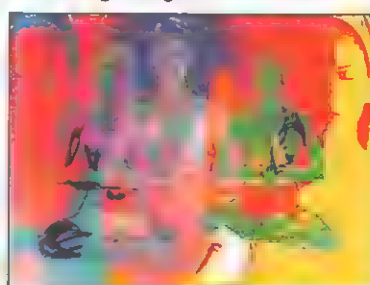
**Page 116** Produce the best possible mono image using the Channel Mixer



**Page 118** Radically alter the effect of the image using the Posterize command



**Page 120** Have fun applying gradient maps to the posterised greyscale steps



**Page 121** Use duplicate layers and blending modes for creative psychedelia

to adjust and enhance the effect in limitless increments.

## Your own photo

This tutorial can be followed using any image you like. To keep things as clear as possible in our screenshots, we've prepared a cut-out with a transparent background from a picture library photo. This allows you to concentrate on the changes in the subject without worrying about what's happening in the background. It also means that you can make duplicates on multiple overlapping layers to build up a stylish photo montage with the minimum of effort. You'll find tips for creating cut-out

images overleaf, but full instructions on filter effects and mask painting techniques are beyond the remit of this book. If cut-outs seem daunting, use any digital photo you want.

## Combined skill

Photoshop mastery doesn't lie in one set of skills, be it colour correction or anything else. If all you can do is adjust colours on a Background layer then you're missing out on great swathes of what Photoshop has to offer. Hopefully this tutorial will encourage beginners to learn more about manipulating layers as well as nailing that core function — editing colour.



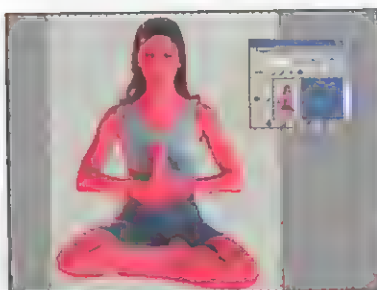
# Prepare the base image

Tidy up blemishes and analyse the channel data to identify issues for colour correction



## Cut-out image

The cut-out image of our yoga model was originally a full-frame photo taken from a royalty-free picture library. The background, itself flooded in red light, was cut away carefully using Photoshop's Extract command under the Filter menu. This left us with a clean cut-out of the girl over a transparent background, all in a single layer.



**1** Open the image you want to work on. For the sake of simplicity, we'll assume that your image exists as a single unlocked layer. Working on a locked Background layer won't stop you following the tutorial, but it will prevent you from grouping layers into sets for further manipulation later on. For this tutorial you'll find it helpful to keep the Layers palette open.

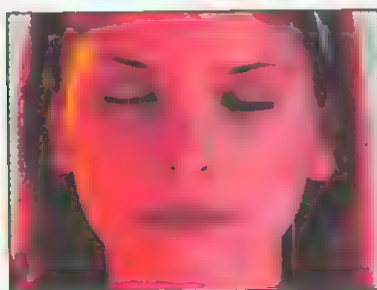


**2** Some of the enhancements applied in this tutorial are susceptible to grain and speckles, potentially producing lots of image 'noise' where smooth, continuous tones are wanted. To check if this needs fixing, zoom in close on the image. Our example here reveals quite a lot of film grain, which will cause no end of problems.

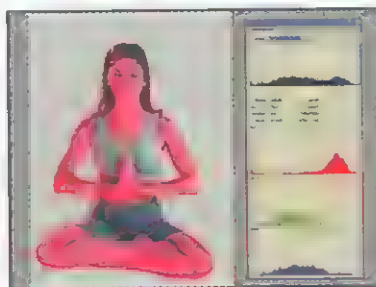


## Unlock layer

Practically all digital photos are first opened in Photoshop as a single locked layer with the label 'Background'. The easy way to unlock this Background layer is to double-click on its thumbnail in the Layers palette, accept the prompt to rename it 'Layer 0', and click OK.



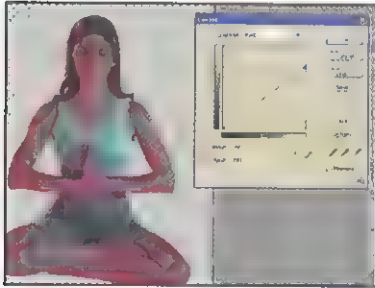
**3** We've solved the problem with a rough and ready solution. Go to Filter > Noise and apply the Despeckle command. This isn't normally a recommended filter for image enhancement because you lose detail, but for our purposes all we're interested in is smooth tones rather than fine detail. One pass is usually enough to take the edge off the film grain without blurring the photo completely.



**4** Zoom back out to view the whole image. If you're running Photoshop CS, open the Histogram palette and choose All Channel View from the palette menu. If you're using an earlier version, open the Histogram window from the Image menu, then view the channels one by one from the menu at the top. Note that our image suffers from too much red in the highlights (the right end of the histogram).

# Colour correction with curves

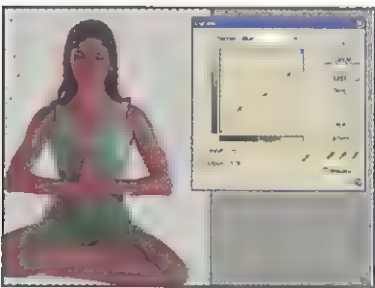
Correct the colour content of your image with some careful adjustment of the channel curves



**1** Open the Curves window from the Image > Adjustments menu or by typing the keyboard shortcut [Ctrl]+[M] ([Command]+[M] on a Mac). Choose whichever colour channel needs adjusting in your own image. To tone down the channel colour in the highlights, click the top-right edit point of the curve and drag it downwards as shown.



**2** Reducing highlights in one channel has the overall effect of darkening an image, as well as correcting that one colour component, but don't worry too much about this yet. Instead, try to rebalance the other two channels to get the right colour first. Choose another channel, add three edit points to the curve and tug it into a gently-inverted S shape like the one you can see here.



**3** Choose the last channel and repeat the rebalancing act for this curve. If necessary, go back and forth between the last two channels to tweak their curves. Remember, you're looking to achieve a colour balance which doesn't reintroduce unwanted tones into the highlights. Don't worry about the image appearing too dark.



**4** Once you're reasonably happy with the colours it's time to deal with the brightness. Switch to RGB composite mode in the Channel menu. Drag the top-right edit point of the curve slightly to the left in order to enhance contrast in the highlights, then add an edit point in the centre of the curve and drag it a little towards the top-left corner as shown. This looks much better.



## Layer mask

One alternative to using the Filter > Extract command to create a cut-out image (see opposite) is to paint a layer mask. Click on the Add A Mask button at the bottom of the Layers palette – the layer needs to be unlocked, of course. You can then paint into the mask with the Brush tool, using black to erase the background and white to paint erased pixels back in (hit [X] to switch between them).



## No Auto

When working on cut-out images in layers with transparent backgrounds, don't even bother trying the Auto correction features such as Auto Levels or Auto Color. The very nature of cut-outs is such that only a limited tonal range is available, because most of the original image is missing. As a result, there's insufficient information for the Auto correction commands to do anything useful with.

# Custom grey channel mixing

Now we can use the Channel Mixer to convert the image into a perfect monochrome shot



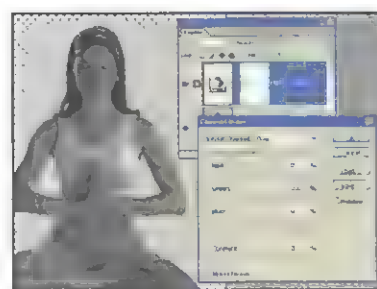
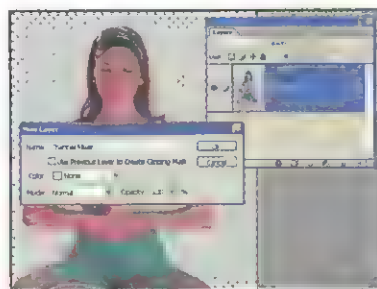
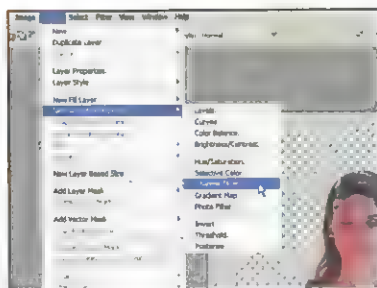
## Clipping mask

The 'Use Previous Layer to Create Clipping Mask' option in the New Layer dialog window in step 2 could more helpfully be labelled 'Link to previous layer'. This isn't necessary when working on just one image, but linking adjustment layers to specific image layers can be useful. This is particularly true if you want to duplicate or add new image layers to the document, but don't want the adjustments to apply to these new layers as well.



## Subsequent linking

If you follow this tutorial and only later decide to link the adjustment layers to specific image layers, here's how to do it. Hold down the [Alt] key ([Option] on a Mac) and move the cursor over the horizontal dividing line between the two layers until a linking symbol appears in the cursor. Click once and the two layers are linked. Repeat the action to unlink them if desired.

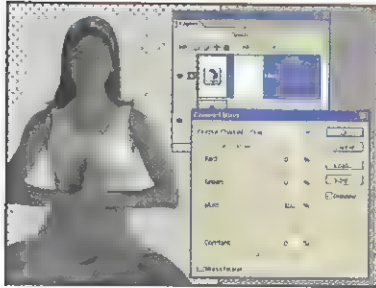


**1** Save your image using the File > Save As command before moving on. Now call up the Channel Mixer window, but instead of applying it directly from the Image > Adjustments menu we suggest you apply it within an adjustment layer. Go to the Layer > New Adjustment Layer menu and choose the Channel Mixer command from there.

**2** Before the Channel Mixer window opens you're presented with a New Layer dialog which gives you the chance to give the layer a custom name, colour, blending mode and opacity. You can also link it to the image layer with a clipping mask (see sidebar). But for now just click OK to accept the default settings.

**3** When the Channel Mixer window opens, tick the Monochrome option at the bottom. By default, this desaturates the image using the greyscale data in the red channel as the basis for the image's new appearance. However, in our case the red channel data seems to give a murky flat grey, when we need a wider range of tonal values to play with.

**4** It's too late to change colour using the Output Channel menu because you've already desaturated the image (unless you click Cancel and start again). So highlight the Red value and type 0. Press the Tab key on your keyboard to skip to the Green value and type 100. Now you can see what the green channel has to offer. To be honest, it's worse than the red in this instance.

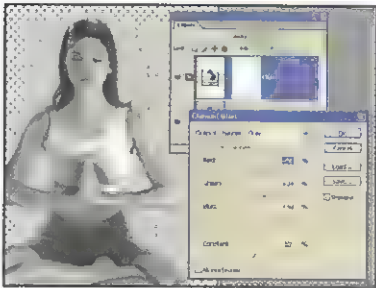


**5** Repeat the process to view the blue channel's greyscale data at 100%, again keeping all other channel values at 0. Unfortunately, the blue doesn't do it for us either; it's quite dark, as you can see. What's needed is a mix of all three channels, which of course is what the Channel Mixer is for.

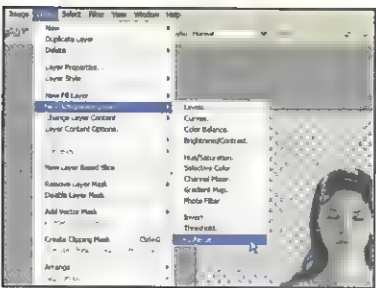


## Mixer in colour

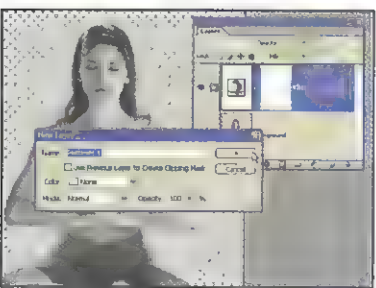
As soon as you tick the *Monochrome* option in the Channel Mixer window the *Output Channel* menu is set to *Gray* and the other menu items vanish. Unticking the *Monochrome* option does not retrieve the component channel menu items again. While you might think it's therefore worth mixing the channels while still in full colour mode, in practice you'll find it impossible to guess at a decent desaturated gray.



**6** Drag on each channel slider in turn to adjust the emphasis for each greyscale component until you achieve a happy tonal balance with good contrast. In general, the best results are usually achieved when the three channel values add up to roughly 100%. Here, however, we've pushed the values much higher (a total value of 138%) and reduced the Constant slider by 10%.



**7** Having created a good-looking desaturated monochrome effect, click OK to close the Channel Mixer. Now let's move on quickly to create a compound effect, again as an adjustment layer rather than a direct command. Go to the Layer > New Adjustment Layer menu and choose *Posterize*, right at the bottom of the submenu.



**8** As before, you'll be prompted by a New Layer dialog window to give the adjustment layer a custom name, clipping mask link, layer mask background colour, transparency blending mode and opacity value. Just as on the page opposite, accept the default settings by clicking OK, so that you can get working on the Posterize effect demonstrated overleaf.

## Real percentages

The Channel Mixer allows you to assign seemingly unreal values to individual channels between -200% and +200%. Unless the image you're editing is a complete disaster area, you'll hardly ever need to drag a slider into minus figures. However, you can use the Channel Mixer as an analysis tool to reveal detail which you know to be specific to certain colours, allowing you 'turn off' the other channels completely by dragging them to -200%.



# Determining Posterize levels

Experiment with different level settings for the Posterize layer to see the effect on your image



## Smooth tones

The success of the Posterize effect relies largely on having a good tonal range and smooth tonal transitions in the image. This was achieved by cleaning up the image, correcting colour problems and rebalancing the greys. For comparison, open the original image, desaturate it ([Ctrl]+[Shift]+[U] or [Command]+[Shift]+[U]) and apply the Posterize command directly. Grainy, isn't it?

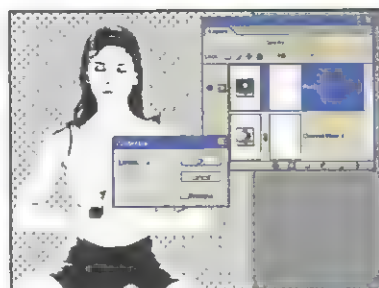


## Layer order

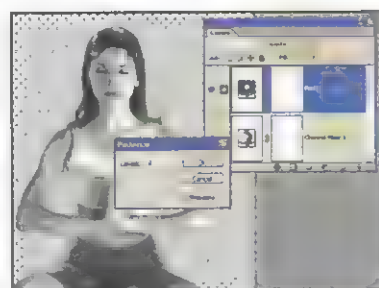
Note that whether you link adjustment layers to image layers or not, the stacking order of adjustment layers makes a big difference to the result. If you like, try changing the order of the layers by dragging their thumbnails in the Layers palette up or down. For example, posterising the colour image before desaturating it with the Channel Mixer produces a duller and somewhat complex set of grey levels.



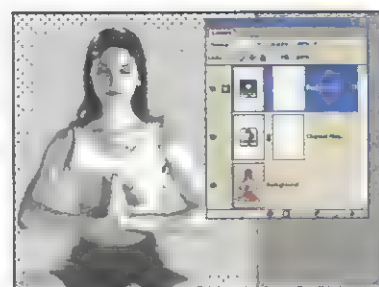
**1** At this stage you've added a new adjustment layer for the Posterize command, and are now being prompted to enter a number of levels for the effect. If you remember from page 77, the number of levels actually refers to levels per channel. But since our image is currently in monochrome, the number of levels will dictate the number of different greys you can see.



**2** To illustrate this point, change the Levels value from the default 4 to 2. At just 2 levels, you get just two colours: black and white. The effect is the same as a bitmap. If this was the effect you had wanted, however, you would have been better off either converting the image to Bitmap mode (see page 24) or using the Threshold feature (page 76).



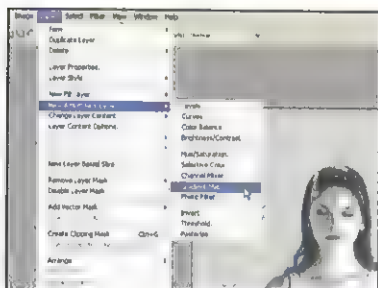
**3** Now try a Posterize effect using 8 levels. This figure is starting to provide enough greys to make sense of the image, while the smoothness of the monochrome tonal transitions ensures that the result is full of distinctive areas of flat grey, rather than dotted pixels sprayed here and there. This is a bit more like the effect that we want.



**4** However, the effect we're trying to achieve is more impressionistic, turning the yoga model into something more like a graphic symbol rather than just another treated photo. Dropping the number of levels to 6 ensures that the image comprises larger areas of contiguous flat greys. You'll need these in order to make the most of the gradient map that you'll add next.

# Colouring the greys

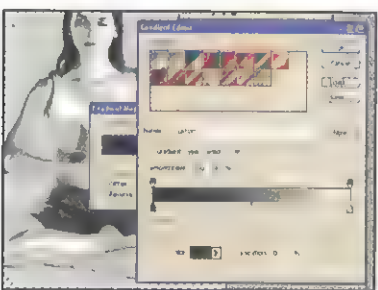
Choose a gradient map to interact with the posterised grey areas, then customise it



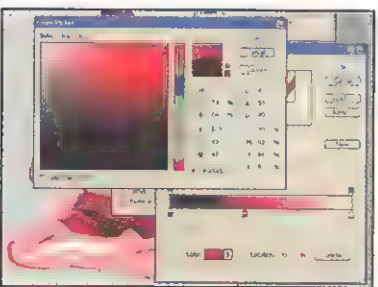
**1** Save your document before continuing. Now you'll apply a gradient map to the image but, unlike in the instructions on page 78, you'll apply it in another adjustment layer. Go to the Layer > New Adjustment Layer menu and choose the Gradient Map command. As before, when the New Layer window appears, click OK to accept the default settings.



**2** If your current Foreground and Background colours are set to black and white you won't see much of a change in the image, because the Gradient Map window normally defaults to the Foreground to Background gradient – which of course is a simple greyscale ramp. Let's adjust this straight away. Click on the greyscale gradient itself to open the Gradient Editor window.



**3** You can now view and edit the current gradient. For good form, though, click on the New button to make a copy of the current gradient and give it a more useful name than the default 'Custom'. This leaves you free to add colour stops to this gradient, and change the black and white extremes to any other colour you want.



**4** Take things easy at first, though. Begin by clicking underneath the greyscale ramp in the Gradient Editor window to add a colour stop. Click on its swatch next to Color, and the Color Picker will appear. Choose a colour such as the dark red shown here and click OK to see how the introduction of red has affected the preview of your posterised image.



## Primary colours

In order to set colour stops on the gradient ramp which conform to primary and secondary colours such as red, purple, yellow, green and so on, click on the Custom button in the Color Picker window. Choose any of the Pantone Solid libraries from the Book menu at the top, and you'll find these key colours are always listed together conveniently at the beginning of each library.



## Multistep gradients

Instead of relying on simple linear gradients, add more colour stops along the gradient ramp. This lets you be more specific about the colours and tones which will be used by the posterised image. If you create a custom gradient with lots of different colour stops, perhaps all based on a similar hue rather than a full rainbow, you'll see dramatic changes when re-editing Posterize levels and the Channel Mixer layer on the following pages.



# Colouring the greys continued

»



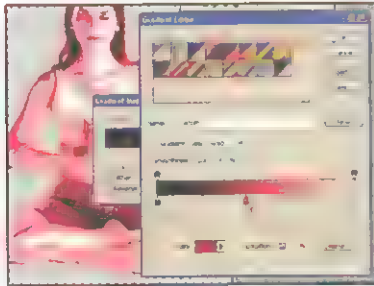
## Instant layers

You can create new adjustment layers directly from the Layers palette. When you click on the 'Create New Fill or Adjustment Layer' button, a drop-down list of adjustment commands appears. Choosing a command launches the relevant adjustment window directly. If you still want to see the New Layer prompt, hold down the [Alt] key ([Option] on the Mac) when you select the command.

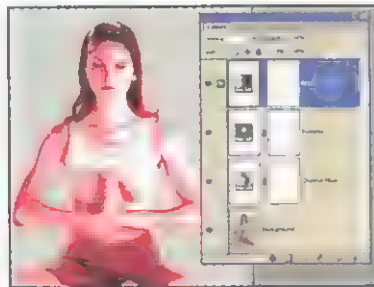


## Layer sets

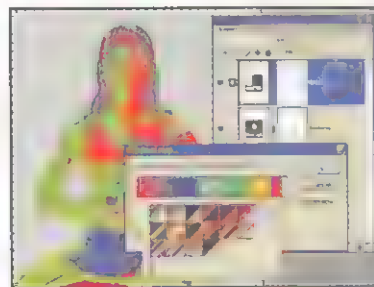
In order to create the final image shown opposite, we duplicated the original image and its adjustment layers for each instance of the yoga girl you can see. To make these duplicates easier to handle we divided them into separate Layer Sets, which are just subfolders within the Layers palette. Create a Layer Set by clicking on the Folder button at the bottom of the palette, then drag and drop individual layers into it.



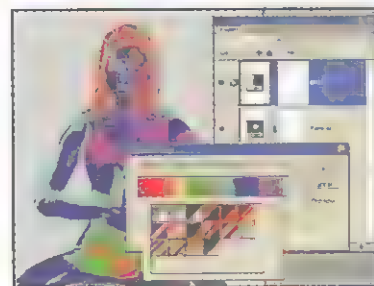
**5** Click and drag on the colour stop you've just added. Moving it left and right across the gradient ramp will alter the colours applied to the preview image in the main window. Feel free to experiment further, adding more colour stops to see the effect they have on the image. When you've achieved a reasonable result, click OK to close the Gradient Editor, and OK again to close the Gradient Map window.



**6** Expand the Layers palette if necessary so you can view all the layer thumbnails at once, from the original image layer through the three progressive adjustment layers. In fact, you could have made the Curves adjustment at the beginning within an adjustment layer, and this is certainly something we would recommend. It means you can always return to your original image layer.



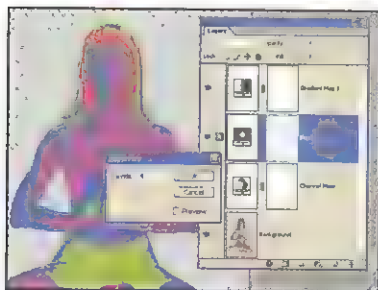
**7** The original image is not the only thing you can revisit. Double-click on the Gradient Map 1 thumbnail in the Layers palette (not its name or the blank white mask) to reopen the Gradient Map window. Click on the menu button next to the gradient preview to access other gradient presets, and try a few out. When you use adjustment layers, you can always change your mind.



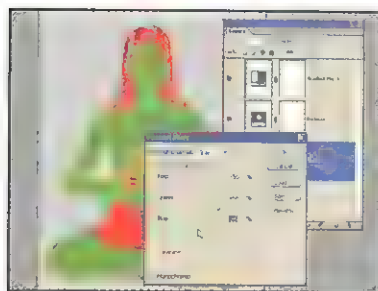
**8** Take the opportunity to try other gradients to see how they map to the posterised grey levels. Since there are only six levels to colourise, not all of the colours available in the spectrum gradients can be applied, nor is it obvious how to ensure that certain colours are used and others aren't. Here, for example, the red and yellow areas of the gradient are barely evident in the image.

# Return and adjust more

Having applied adjustments and effects within adjustment layers, it's easy to re-edit them



**1** Double-click on the Posterize 1 layer thumbnail to reopen the Posterize window. This was set to 6 levels. Change this value to 4 and watch the effect it has. Having reduced the number of grey shades to four, the gradient map adjustment layer is forced to remap the currently-selected gradient to match fewer steps along the ramp. This can radically alter images based on rainbow gradients.



**2** Finally, select the Channel Mixer 1 layer thumbnail. Dragging on the channel sliders brings about a yet more radical shift in the colours mapped from the gradient to the posterised levels. This is because you're changing the greyscale tones, causing a ripple effect through the adjustment layers. Feel free to duplicate your image and build up your poster artwork across blended layers.



## **Pass Through blend**

The final result shown here was created by linking the adjustment layers to the original image, duplicating them together as Layer Sets, and applying different transparency blending modes to each Set. By default, each Set is given a blending mode called Pass Through, which ensures that other blending modes used among the layer stack will leave that particular group of layers alone.





# On your CD-ROM

Here's how to get the most from the disc that accompanies your Focus Guide

To access the wealth of resources and software on your disc, including the full version of ColorImpact 1.7, first insert the CD into your drive. Whether you're using a Mac or a Windows PC, the disc will work equally well. If the disc interface doesn't run automatically, look at the opposite page to find out how to start your installation manually.

## Before you go on

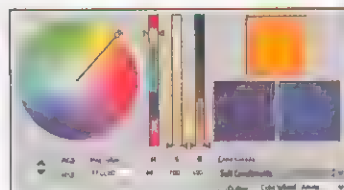
The first item that should appear on your screen is the disclaimer

window; here you'll need to click on 'I Accept'. Please remember that this disc has been scanned and tested at all stages of production, but – as with all new software – we still recommend that you run a virus checker before use. We also recommend that you have an up-to-date backup of your hard disk before using this disc. Future Publishing does not accept responsibility for any disruption, damage and/or loss to your data or computer system that may occur while using this disc, or the data and programs on it. Please

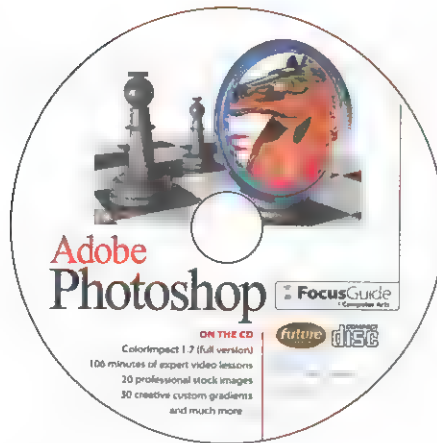
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**ColorImpact helps you create effective colour schemes with ease. Now there's no excuse for gaudy websites!**



consult your network administrator before attempting to install any software on a networked PC.

## Installation

Once your CD interface has loaded, you can access any of the files, software and other resources included directly from your CD. Simply click on the animated 'Click' link and choose the section that you're interested in from the menu. The video tutorials require the latest QuickTime Player, from [www.apple.com/quicktime/download](http://www.apple.com/quicktime/download).

If you have a query about your disc, email our support team at ([support@futurenet.co.uk](mailto:support@futurenet.co.uk)) for help. If you want to talk to a member of the team, call 01225 822743. Note that we can only provide basic advice on using the disc interface and installing the supplied software. We cannot give in-depth help on specific programs, or on your particular system configuration.



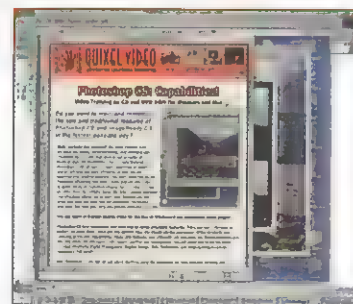
## Starting your installation manually

**PC users:** click on the Windows Start button and click Run. Then click Browse and go to the CD directory in My Computer. Look for a file called PFGi.exe and double-click it. Then click OK in the Run dialogue, and the CD should then load up.  
**Mac users:** Double-click the disc icon, then double-click StartMAC or StartOSX, depending on which OS you're using.

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To complement our regular video tutorials this month, we've included an 80-minute Photoshop CS special. Many a well-intentioned photo has been ruined due to a lack of light, the wrong settings and not enough patience. With this expert training you'll be equipped to rescue even the most disappointing pictures. As a special offer to Adobe Photoshop Focus Guide readers you can purchase the full Photoshop CS Capabilities video training package at a £10 discount, for only £49.95. For the upgrade URL and more information on Photoshop CS Capabilities check out the CD. You'll need QuickTime to view the video, which you can download here:



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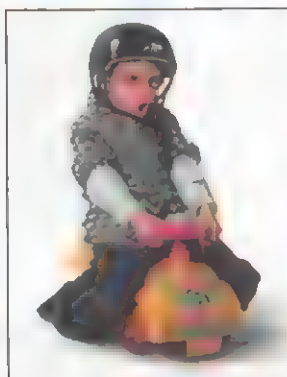
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A great many more images  
are available online at the  
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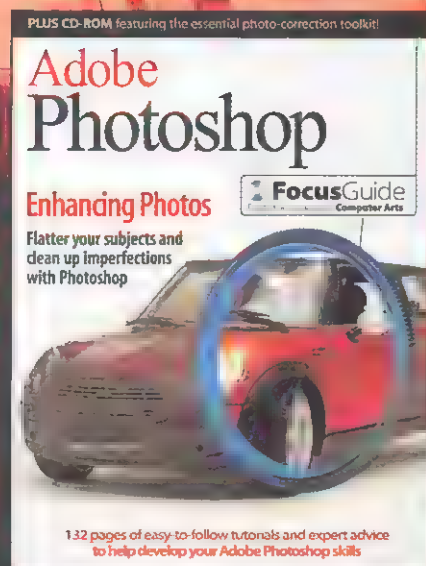
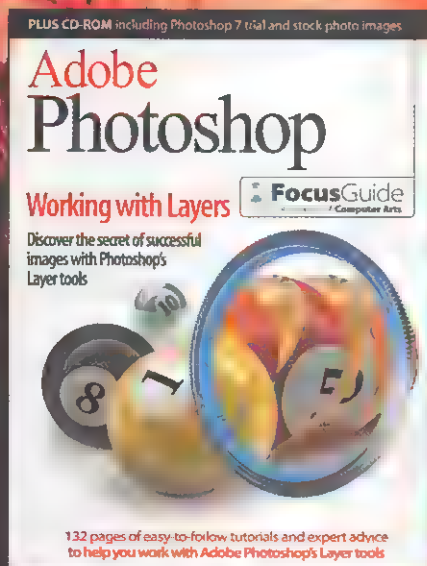
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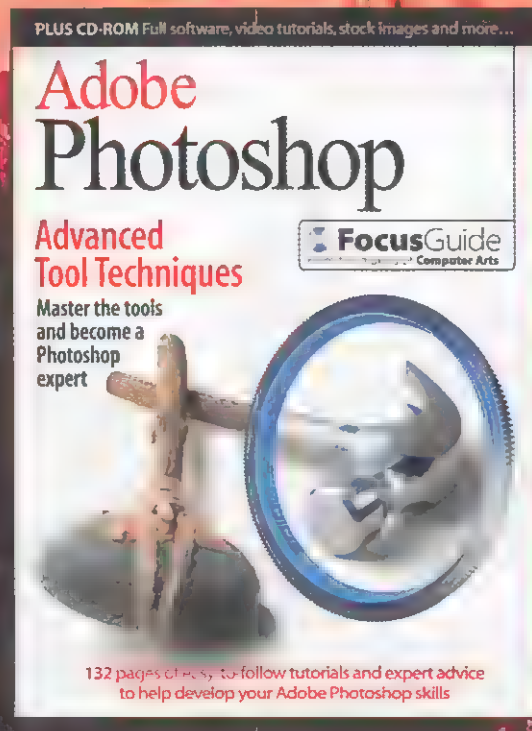
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## ISSUE 13 ON SALE 29 JULY

# Glossary

We always try to cut out the jargon, but it helps to add a few words of Photoshop-speak to your vocabulary...

## Anti-aliasing

Moving pixels around can cause undesirable jagged edges to appear, where edited pixels have not blended smoothly together. Anti-aliasing refers to the process of smoothing out these jagged edges for a more natural look.

## Blending modes

Blending modes are used to determine how the pixels in a layer are blended with underlying pixels on other layers. By applying specific blending modes to individual layers, you can create a wide variety of effects.

## Brushes

Brushes enable you to paint on Photoshop images with colour, other bits of images and pre-defined patterns. They mimic real brushes in that you can alter the size, hardness and texture in order to achieve the effect you want.

## Calibration

The process of adjusting a device to bring its behaviour into line with a known specification, helping to reproduce colours accurately. For example, colour monitors are calibrated to a specific colour temperature, gamma, and black and white luminance.

## Colour channels

There are three or more colour channels in all full colour images, depending on which colour mode you're using. For example, RGB mode contains red, green and blue channels, while CMYK mode contains cyan, magenta, yellow and black channels. Photoshop enables you to alter each channel independently.

## Filters

A filter is a preset tool within Photoshop, which applies an effect to an image (or a selection within the image). Some filters apply their effect in one click, while others offer more complex settings. Filter categories include Sharpen, Blur, Artistic and Stylize. Each of these offer further options via fly-out menus. For a complete list click in the Filter menu.

## Gamut

The range of colour that a device (such as a printer) can produce, or the range of colour that a colour model can represent. If a colour is said to be 'out of gamut', it will not be reproduced accurately by the printing process or other intended destination.

## .GIF (or .gif)

A type of image file format best suited to producing simple images for the web. Examples include logos, banners, buttons and anything made up of only a few flat colours.

## Greyscale

An image is greyscale if it contains no colour information. Using Photoshop you can transform a colour image into black and white, with many gradations of grey in a single channel. This is known as a greyscale image.

## .JPG (or .jpeg)

A type of image file format that gives a desirable combination of small file size and good-quality photo reproduction. It's commonly used in digital cameras to store the images that you take. The small file sizes also make it ideal for the web.

## Layers

Layers containing effects or elements of images can be stacked on top of the original image layer (the background) in order to change the appearance of the image. Layers do not directly affect the layers beneath them, just as a blurry piece of glass placed over a photograph does not actually affect the photograph – in both cases, it's the appearance that has been changed, with the original image unaltered.

## Marquee

The flashing dotted outline that surrounds a selection. You'll also see it referred to in some places as 'marching ants'.

## Rasterize

When you 'rasterize' a graphical element, you convert it from a vector to a pixel-based image. It will no longer be scalable like a vector, but can still be edited like other images in Photoshop.

## Resolution

A measure of how many pixels make up an image. A resolution of 300dpi (dots per inch) is recognised as the minimum if you're intending to print your images. 72dpi is sufficient for images intended for the web.

## Selection

Any part of an image which you select with Photoshop's tools, usually indicated by a marquee around it. Making selections enables you to work on parts of an image, or remove them, without affecting the rest of the image.

## Thumbnail

A small, 'thumbnail-sized' version of an image. You'll find

them in folders of images and in Photoshop's File Browser. Because they're smaller than a full-size image they're fast to load and you can browse through them more quickly, which makes finding the file you're after much easier.

## Pixel

An abbreviation for 'picture element', it's essentially a tiny dot of colour on screen. Most images are made up of millions of pixels, which combine to make an image look seamless. Zoom in very close to an image, however, or enlarge it to a high degree, and you can clearly see these individual pixels.

## PSD

Photoshop's own file format, which preserves elements such as layers and channels. If you're editing an image file, it's sensible to save it as a PSD, in order for the changes you've made to remain editable when you next open it.

## Spot Colour

A method of specifying and printing colours in which each colour is printed with its own separate ink. In contrast, process colour printing uses four inks (cyan, magenta, yellow, and black) to produce all other colours.

## Tool options bar

When a tool is selected, the corresponding tool options bar automatically appears along the top of the Photoshop window, giving you access to various options relating specifically to the tool. These often include such effects as Anti-aliasing and Feathering.

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with the help of our comprehensive index

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